DRAGON USER

The independent Dragon magazine

December 1987

Contents

STOP PRESS + STOP PRESS + STOP PRESS
Starship Software's titles now available from Pulser Software. See page 21.

Editorial

ON 5th December 1987, the new-look, comfy chairs and carpets version of the 6809 Show hits London in the Covent Garden area — see the ad. on the back page for details. Do come. The Dragon shows need your support, and if you need tempting, you can always combine it with a bit of Christmas shopping in one of the old town's nicest bits. H C Andersen will be offering OS-9 at an even further reduced price just for the day of the show, so it's worth the trip just on that count.

If you have ears, prepare to sprain your wrists. Next month we are starting one of the longest programs ever run in DU, a set of extensions for *Music Maker* by David Makin. Bring your best reading glasses, too, as well as your ear trumpets, because we'll either have to make it small, or re-name ourselves *Dragon Muso*.

I observe that Paul Grade of NDUG has been appealing for help with *Dragon Update*, pending his nervous breakdown, and he hasn't been getting a lot of response. Now come on! Some of you out there must have the odd evening, even if you can't help regularly or often. I don't know what Paul's like at delegating, but he's beginning to sound like a winner at overworking. It doesn't matter if you're not close by, give it a try. Contact Paul at 6 Navarino Road, Worthing, Sussex, or tel. 0903 207585.

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How to submit articles

The quality of the material we can publish in *Dragon User* each month will, to a very great extent depend on the quality of the discoveries that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to *Dragon User* for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Letters

Pulser praise

I must write to tell you of the excellence and prompt service that I received from Pulser Software.

Having just recently aquired a disc drive and DeltaDOS and having used *Magbase* tape version I phoned Brian O'Connor on Tuesday evening with a view to purchasing a copy only to be informed that they did not have a DeltaDOS interface but would I phone back after six.

I phoned back and was told that he would get one and would supply me a copy with *Dragon User* and *Update* files for £6.99 + £0.50p&p. I posted my cheque on the Sunday and received the disc first post Thursday.

Well done Pulser for an excellent program and service.

Many thanks to Dave Martin and Peter Goodwin of DUDE and Stuart Mills and Paul Grade of *Update* for the help and advice given to set up my system.

Terence Riley
Sheridan
March Lane
Galhampton
Yeovil, Somerset
BA22 7AN

PS How about some DeltaDOS articles? Thanks for a great magazine. Keep up the good work.

Every month we will be shelling out a game or two, courtesy of Microdeal, to the reader/s who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What d'you think we are, mind readers?!

EXTRA PUFF

Lost lament

I'M surprised not to receive any longer the issue "Dragon User". I didn't get the September issue. I started to be yours in February '87, thus it should be ended in February '88. I can't understand why you stopped sending me your issue.

David Bels
101 Avenue St. Exupery
Entree A Appartement 7
31400 Toulouse
France

WELL, a great many people said it, but none more gracefully.

The only readers who have problems now are those whose copies are lost in the post, because, as I said last month, we have no extra copies. I don't mean no spare copies, I mean — (apart from one closely guarded file copy) — no copies.

Inevitably some copies will drift back, duplicates, lapsed members, etc., and we shall keep those for people whose September never arrived. But I suspect — especially where overseas readers are concerned — that a few copies are still trying to get through.

Dream saves faster

SOME of your readers may find the following tip useful, especially if like me thay only have a 32K machine with no disc drive, and are into assembly language programming on the 6809.

The DREAM assembler uses a very slow method of saving its source files to tape, by using the ASCII version of the CSAVE command. Basically it causes (I think) a new file header to be written for every 255 bytes or whatever. You can hear the motor relay going click click click ... all the time during the program saving!

Apart from slowing down the saving of the file, it can lead to a non-readable file if the cassette motor doesn't get up to speed quickly enough after every switching of the relay.

After a bit of searching through memory, I discovered that the control field in locations SH5F8A and SH5F8B contains the start-of-symbol-table address.

In order to save a source file safely, simply exit from the Dream editor via BREAK and ENTER and type the following Basic:

```
CSAVEM"FILENAME",
256*PEEK(SH5F8AA) +
PEEK(SH5F8B), 6H6000,
SH6080
```

Then press PLAY and RECORD on your cassette player, and hit ENTER.

This saves the source code as a straight memory dump which is a heck of a lot quicker and safer than the way Dream does it. TO reload, simply load in Dream, then load in the file with a CLOADM "FILENAME" and type EXEC and you should of course reply 'Y' to the "Old text?" prompt.

F.R.Ellahi
Halifax, W. Yorks

ReaDD RighTT

MANY thanks to P.D. Smith for his letter in the October 1987 issue of DU. There certainly was some confusion between 'clusters' and 'segment allocation size'. I fully agree that the default value of 8 in the standard device descriptors should be left alone. The most significant difference between using a value of 1 and a value of 8 is the time taken to write to the disc. If a value of 1 is used (as I wrongly suggested) lots of time is taken up allocating a new segment once 256 bytes have been written to the file. A value of 8 reduces this work by a factor of eight (in most cases). In practical tests I have found that it takes about twice as long to write a long file using a segment allocation size of 1 as opposed to a value of eight. ('copy' is a special case which is not affected because it allocates space for the full file before any writing starts). This is probably much more important to the average user than a possible 'segment list full' error as described by Mr. Smith.

Having looked more closely at the problem of reading non-OS-9 discs under OS-9 I have found the main reason to be the way the OS-9 drivers rely on information read from sector zero of the disc inserted into the drive. Normally this contains information as to the density, number of sides, and track density (as well as the number of sectors/cluster!). Every time track zero happens to be read by the driver it updates its internal tables using this information. Some drivers allow this information to be frozen once read, and thus the disc can be changed later for a non-OS-9 disc. Unfortunately this is not possible with Dragon OS-9 drivers and so if by bad luck the Dragon-DOS file being read by ReadDD happens to have some of its contents in the first sector of the disc, then thereafter the driver tables will contain junk information and the rest of the disc will not be able to be read properly. Should this problem occur the easiest way around it is to copy the file (under DragonDOS) to a newly formated disc which will then be unlikely to use logical sector zero of the disc. This new disc can then be used to copy the file to OS-9 using ReadDD without any problem.

It is most important to tell OS-9 the format of the disc in the drive by accessing an OS9 disc of the same format as the Dragon disc using 'dir', This is especially true for double drives (96 tpi). Remember that on double sided discs there are 36 sectors per track so the DragonDOS directory starts at logical sector 727 for OS-9 (this means that whenever 'position' is calculated in ReadDD the value 18 should be changed to 36).

Hope this will help to explain any problems some may have had with ReadDD.

Paul A. Dagleish
The Ridings
La Garangers
38850 CHIRENS, France

This is your chance to air your views — send your tips, compliments and complaints to Letters Page, *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Word comes from Spain

THE next letter was written on 21st September, and echoes a lot of other bits of news we have had piecemeal, so I am reproducing it more or less as seen, minus one or two unverifiable comments on Eurohard's present position. No prose of mine can convey the blend of pride and regret in the following report from Spain.

All the true about Eurohard SA

EUROHARD began to sell Dragons at the end of 1984. They made 500 every day.

It was a great industrie and it had a lot of projects for the Dragon. It was supported by the Spanish government, by Planeta, an important editorial (publisher), by SOCIMEX an important industrie, by the regional goverment of Extremadura, and it began very well. In the period of November 1984 to October 1985 it sold 17,000 Dragons, but it also gave nearly 20,000 to institutes and public schools. Since October 1985 the government paid the deficit, but when Eurohard needed money for to do inversions in South American and expansion, his distributors he failed, and was submerged in a very important deficit.

His president Eduardo Menigo resigned. Eurohard owed some money divided in SOCIMEX, Planeta, and TV3, a TV of Catalonia that made a program of how to learn Basic with the computers and using a Dragon.

In the period of October 1985 to March 1987 all the distributors sold his latest stocks of Dragons at ridicully prices. And lately, the last distributor of Barcelona is giving his Dragons to other Dragon users.

In November 1985 Eurohard shut his shops in Madrid and his shops in Barcelona shut last March. In 1986 you can buy Dragons and software but now, in Spain there is nothing that sells Dragon, nothing. His factory in Caceres shut last May, and the unic (only) thing we can do now is wait for a miracle.

I personally never forget my Dragon, because I have passed very entertaining times with it.

The Dragon isn't dead!

Josep Jane
Jaun Maregall, 5
08800-Vilanovai Geltni
(Barcelona)
Spain

I'm sure that you will publish this letter, and I guarantee that all the contents of this letter is true.

WE'VE been getting sporadic letters from all over Europe saying that Eurohard was no longer answering letters or making deliveries, and our attempts to get some news from the Caceres factory were met with a polite blank, until one day nobody answered the 'phone at all.

Josep's letter is by far the most detailed information we have had about Eurohard's fate. If anyone in Europe has any newspaper reports which they can send, so much the better. Include a translation, please — I only read schoolgirl French and Anglo-Saxon.

Eurohard (or its distributors) apparently went on trading on the European mainland for longer than with the UK, so Europeans generally have had more news that England has.

What is readily apparent, and has been for most of this year, is that, barring that miracle, no more Dragon hardware is going to be manufactured in the future by Eurohard, who are still, as far as we know, the official licensees.

It's always a sad moment to receive a requiem for a former supplier. But Dragoners have been getting along quite well by themselves, and look like continuing.

Josep is also now the official representative of the Dragon Soft Club of Vilanova, at the address above.

Dragon to octal

I have written to inform the readers of DU about some features of the Dragon which are not described in the manual that I discovered some time ago. Firstly the Dragon is capable of octal to decimal conversions using '&', for example PRINT &10 will display 8.

Secondly the DRAW command has an easier method of including variables in the string. In a lot of Dragon programs you will see lines such as DRAW "BM" + STR$(X) + "," + STR$(Y)". the Dragon will understand the much simpler alternative: DRAW "BM = X; = Y;". The variable name is preceded by an equals sign and succeeded by a semicolon. This format can be used in place of any number in a DRAW command.

P.D. Smith
University Hall
Birchwood Road
Penylan, Cardiff
CF2 5YB

Ireland calling

I have been getting *Dragon User* every month since issue 1 and since it is now only mail order, I think it is better in every way. I like the maps you printed quite recently and enjoy the odd bit of programming. But there is just one thing I woulf love to see in Ireland and that is a 6809 Show.

I know for a fact that there are still a lot of Dragon owners proud of their machines. If anybody could organize a Dragon Show here, it would be just great.

Keep up the good magazine for a few years more. When all the other magazines are dead, the Dragon will still be alive and kicking.

Gavin Griffin
58 Old Bawn Park
Tallaght, Co Dublin
Ireland

PS I would also like a few penpals to write to so we could swap pokes, hints, old games etc.

Toolkit in a socket

UPON reading the October '87 edition of your excellent magazine (please keep up the good work) I read with interest the article in *Dragonsoft* on premier's *Toolkit* and *Scribe*.

I am in possession of two Premier software packages on Eprom, namely *Toolkit* and *Encoder 09, an excellent assembler/disassembler. I also have Toolkit* on disc, either 5.25 or 3 inch. If anyone has problems obtaining these programs they can write to me.

Also, I notice it says in the article that the software must be used in conjunction with DeltaDOS.

This is not true, as any cartridge may be fitted with the Eprom (I have a cartridge, with two sockets, which will take both programs, in any position) and provided that Dragondos has a spare socket, I don't see why *Toolkit* or *Encoder* shouldn't be fitted to that.

Hope the above is of help.

C.P.A. Burridge
16 Patterson Road
Chesham, Bucks HP5 2DG

NDUG bargain

THE modem review by Ken Smith misses one important point: members of the NDUG get a £5.00 discount on the price. Had Mr. Smith joined prior to purchasing the modem he would effectively have paid only £3.00 to become a member, as the group is a bargain at £8.00. Anyone contemplating purchasing the modem and not already an NDUG member would do well to join and get two bargains for the price of one.

P.J. Beed
27 Findon Rd.
Elson, Gosport
Hants PO12 4EP

My disc runneth over

IS there anyone out there who can help and stop my Premature Disk Full Error? I use Microdeal's *Telewriter* program with Grosvenor Software's SuperDOS E6 chip. The program works well but fills discs far too rapidly. Grosvenor have informed me that there is a problem with *Telewriter* but do not know the cure. their advice was to get in touch with the author of the program, Gordon Twist — I've tried but without success. So does anyone know of a cure before I sink under a pile of discs?

Mike Hides
23 Coniston Road
Dronfield Woodhouse
Sheffield S18 5PY

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

Suppliers get together for Show

DRAGON publishers and retailers are gearing up for the 6th 6809 Show in London on December 5th.

H C Andersen Computer Inc., the official licensees for OS-9 software, will be taking a stand at the show, at the Connaught Rooms in London's West End.

This is the first time that H C Andersen have attended a UK Dragon show, and they will be selling the OS-9 operating system at a special show price of £69.

Harris Micro Software and MacGowan Consultants will be joining forces on a double stand. Bob Harris will be showing his recently published Klik Utility, and MacGowan Consultants have told Harris that they will be demonstrating 'a system of desktop publishing for the Dragon'.

The editors of *Dragon's Roar* are re-launching the newsletter with twenty-six pages, and will be giving away copies. A link up from the show via Prestel, to allow users at the show to communicate with users elsewhere, has been proposed.

Quickbeam will be at the show, demonstrating some new software.

David Machin of *Music Maker* fame will be demonstrating some more of his music software, some of which will appear in *Dragon User* over the next couple of months.

And these are just the ones who have called us here in the last few days.

Dragon User hopes to be seeing *you* there!

Starship in search of new sponsor

STARSHIP Software has had to temporarity withdraw all its software published by Microvision, as a result of that company's recent cessation of trading.

The Cartwrights are currently looking for a new outlet, and would like to hear from anyone who is seriously interested in distributing their games. "I would like to make it clear that I have NOT abandoned the Dragon. I have a couple of new titles finished, and several on the way," says Jonathan Cartwright.

The titles affected are *Starship Destiny, Dungeon Destiny, Wild West Destiny, Composer Companion* and *El Pea*.

Enquiries to Starship Software, 23 Tintern Road, Cheadle Hulme, Cheshire SK8 7QF.

Motorbike repair

THE author of *Motorbiking* in the November issue of *Dragon User* writes to say:

"It has come to my attention that the program can sometimes give unexpected results. This can be rectified by adding the line:

```
2335 S = 0 : P = 0 : X = 6
```

"The notes to the original program still apply."

Booklet for beginners

YORKSHIRE Television are marketing a booklet in conjunction with their Channel 4 production *So We Bought A Computer*.

The booklet costs £1 and is a greatly simplified guide for the prospective user, especially the more serious or business user. Literally an introduction to the idea of computers only, the style and brevity of the booklet gives rise to a number of small inaccuracies, but anyone starting to use or expand a computer system seriously would quickly clear these up by reference to more comprehensive sources. This is a wedge in the door.

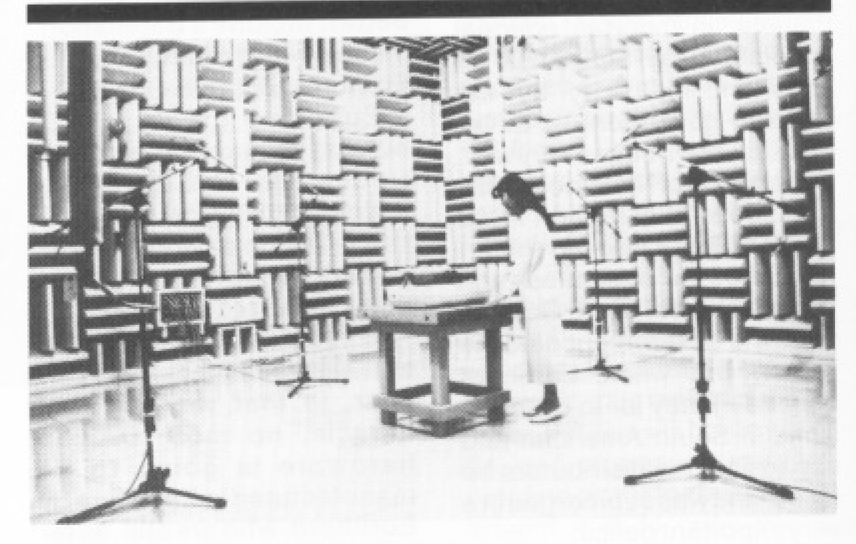
The six-part series is also available on video (VHS or Betamax) for £49.93 for 'business and commercial use' and £29.95 for bona fide educational institutes. Both prices include VAT.

The programs are also available singly, but at a rather less attractive price.

68 Club keep going

TWO copies of 68 Microcosm, the journal of the 68 Micro Group for May and July, arrived more or less nose to tail. July includes a hardware/software project to make a calendar/clock for the MC68000. May is mostly a report on the Group's AGM. They seem to have faced and once again averted the catastrophe which confronts all small organisations from time to time: the problem of co-opting able and willing volunteers to undertake the necessary tasks involved in running the club.

However, the July issue demonstrates that they are well under way again. The membership secretary is Keith Barnes at 174 Great Cob, Springfield, Chelmsford, Essex CM1 5LA, and the group has a bulletin board number on Tom Goodfellow's 24-hour board at 01-316-7402, 1 start, 1 stop, 8 data, 300/300 or 1200/75 baud.



As silent as a printer

EPSON are joining the rush to develop quieter printers by studying sound pressure levels from printers in their anechoic chamber at Hirooka, Japan.

The chamber is designed to provide a base background noise level of 0.5dBA (acoustic decibels), compared to 'domestic room' background noise of around 30dBA, a near-by whisper (5dBA) or air conditioning (3dBA). The lowest audible level for humans is 0dBA.

Under these conditions, with no echo or reverberation present to multiply sound sources and direction, microphones can measure sound levels unaffected by position or direction.

The noise made by operating printers will be recorded, analysed by computer and used as a sound-simulation source.

Epson are committed to producing, within 12 months, a new generation of printers with sound levels of well below 55dBA. Laser and ink-jet printers are already available below this level, but some printers print at 80dBA, as compared to heavy traffic passing a window at 75dBA.

Tape/mag

Dragon Taped is a collection of Dragon programs and reviews on a cassette tape, which can be bought from A.R. Hopkins, Common Farm, Shifnal, Shropshire TH1 19HN. Mr. Hopkins will supply more details on request. The tape costs £1.50, and if it is successful there may be further issues. No typing!

New Era for modems

THE New Era Interface is a new piece of hardware hot off the production line from Harry Whitehouse (which is now the official trading name of Peaksoft's Dragon retail division, as well as the name of Harry — who runs it). The interface provides Dragon owners, with "plug in and go" multi-speed communications.

The device is an RS232 port with instant-use cartridge software, suitable for the '32 or '64. It also has a through port, so that disc owners can leave the DOS cartridges connected up. The DOS is simply plugged into the New Era, which need never be removed from the port.

A modem can be linked easily to the New Era, as the connections are standard terminal strip. If the user prefers, the interface can be supplied with a suitable cable ready-connected.

Transmission and reception speeds from 75 to 2400 baud (including the 1200/75 and 300 speeds necessary for Prestel and bulletin boards) are selected with dip switches and, once the speed is set, the user only needs to press three keys on the keyboard to go on line.

The New Era costs £69.95, including VAT and postage. Whitehouse also publish the Dragon User's Directory of Communications, which lists the names, interests, hardware and Prestel mailbox numbers of Dragon owners throughout the country. A free copy is supplied to every New Era purchaser.

The New Era package does not include a modem, as purchasers may be upgrading from an outdated or less convenient system. However, Harry Whitehouse also offers a Prism 2000 1200/75 modem at the same discount price free of charge to anyone who takes out a year's subscription. Harry Whitehouse has made arrangements with Micronet to co-ordinate despatch of the free modem at the buyer's request.

Full details are in a five-page information pack from Harry Whitehouse, 48 Queen Street, Balderton, Newark NG24 3NS, tel. (0636) 705230.

Larkspur adventure

Larkspur Waldorf is trapped is a new graphic adventure game which uses a system of five windows. THe quest is to escape from a castle where you, the hero, Larkspur Waldorf, are trapped. The adventure runs entirely from the PMODE 4 graphics screen, and is now ready for use on the Dragon 64 as well as the Dragon 32.

Co-author John Smallwood says: "Anyone who bought the game at the show in Rochdale will have the 32-only version. I will personally exchange it for a new version if it is set to me with 50p to cover postage. Otherwise, it is available from John Penn Software, the organisers of the London show, for £3.50."

Write to John Smallwood at 51 King's Drive, Fulwood, Preston, Lancs. PR2 3HQ.

Only Pharoah

A NEW adventure game, *Pyradventure — Amenophis III* is now available from the author for £2.95 plus 50p p&p.

Described as 'the search for a golden death mask beneath an Egyptian pyramid', the all-text adventure has speech and a graphic loading screen. Cheques/POs should be addressed to T. Wheals, 23 Ashby Road, Thurton, Norwich NR14 6AX.

DOSes located

PRO-Tech Systems (GB) have located 'the last remaining stocks' of DragonDOS and Delta disc cartridges. Pro-Tech are offering to supply these, with any of the available DOS version ROMs, including DOS 'Plus' (ScottDOS) which has advantages such as compatibility with other DragonDOSes.

In addition, Delta2 (double density) cartridges are available for Delta users.

Both types can be supplied as separate cartridges or as a complete system with Cumana or Chinnon disc drives, for as little as £136 under the terms of the current discount offer.

For more information from Pro-Tech, send a large SAE to 25, Pelican Road, Pamber Heath, Basingstoke RG26 6EN.

IF any reader does have serious delivery/non delivery problems with any supplier, whether or not they advertise in DU, we would like to know. Only rarely can we do anything to improve a genuinely dodgy situation (which fortunately are rare) but it helps us to build up a profile and identify any long-term problems. Come to think of it, that includes *Dragon User*, as, naturally, we want to know about any bottlenecks as early as possible. Apologies in advance for not acknowledging every letter, but where we *can* be of practical help, we will.

Adventure Contact

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Helpine, 12/13 Little Newport Street, London WC2H 7PP. As soon as enough entries have arrived, we will start printing them in the magazine.

Don't worry — you'll still have Adventure Trial to write to as well!

Adventure . . . .
Problem . . . .
. . . .
Name . . . .
Address . . . .
. . . .

New software for review should be sent to *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Comms eprom achieves the peak of praise

Title: COMRON Eprom
Supplier: Peaksoft
Price: £14.95

THE COMRON is a substitute for the Eprom fitted in the Modem House Dragon communications cartridge and provides access to Prestel and other Viewdata bulletin boards, as well as boards requiring 1200/75 scrolling software. It also has other features.

The fitting instructions are clear and concise, no soldering or technical abilities are needed, merely care. Overall, the operation is quick and simple; if, however, the task appears too daunting, Peaksoft offer a fitting service at a cost of £2.50, which includes return insured first class postage, packing and VAT.

Operation is a revelation! The software does auto-run on power up; if, however, it does not, merely exit to Basic and call the COMRON by a simple keyboard instruction.

Once called, the protocol must be set by selecting either (V)iewdata and (P)layed or, for other boards, selecting (A)scii and (S)crolling.

The whole package is menu driven so, if the protocol you have set requires changing, a simple instruction in whichever mode returns you to the main menu for re-selection. Once the protocol is set, you may enter the terminal mode and dial up the host computer. Some boards (including the 6809 board) use multi-baud rates and adjust automatically to the user's rates; however, some modems will drop the line if a carrier frequency is not detected after a few seconds, but redialling and a few seconds' delay will rectify the situation.

Control instructions in the Terminal mode are clear and simple and, indeed, Prestel Escape, controls some very useful special functions. The commands are shown as an Appendix in the written instructions and will enable colour codes, mosiac graphics, solid blocks, dots and double or normal height, all at the touch of an alpha keyboard instructions.

Within the main menu other options are the ability to save the current page to tape or to load a saved page from tape. The current page can be sent to a printer or a screen dump facility to an Epson-compatible printer. Another option is to an automatic mailbox menu which allows the preparation of up to 516 characters including Escapes. Within the mailbox menu commands are again clear and easy to save a prepared message on tape or to load a prepared message from tape and of course to return to the main menu.

When preparing a message, the characters are available for Prestel use, which again includes a facility to return to menu.

Finally, one 'piece de resistance' of this excellent eprom is, in my view, the buffer menu. Bulletin board text can move through the screen too quickly to read, let alone digest, and as calling bulletin boards normally requires a trunk call, the buffer is designed for Ascii use to allow text to be saved immediately and later perused off-line at leisure. The buffer does also save Prestel screens, but they do contain spurious characters and is the only negative comment I have against it. The buffer will store up to 20,000 characters saved in a loop, so that when it is full it will start again at the beginning, overwriting anything which may already have been saved. However, a brief check on the buffer menu will tell you how many characters have already been stored in the memory, and you may then save the buffr to tape or to printer. There is, of course, a load buffer facility which allows a saved tape to be reloaded, and, if there is a tape error, affords the opportunity to re-set.

Overall, I have nothing but praise for this eprom, the description of its facilities and the operating instructions are first class, simple to understand and easy to operate. the ease with which I was able to use it ws a tribute to its simplicity, nevertheless allowing a powerful tool in the hands of a technical simpleton.

If there are any problems, as always, Peaksoft are very helpful indeed. The COMRON is excellent value for money at £14.95 and I have no hesitation in giving it full marks and my hearty endorsement.

R N L Hewson



Kurgan's crash turns out to be lucky for adventure

Title: *Starcrash*
Supplier: Simon Hargrave, Crawley Hill Farm, Uley, Dursley, Glos. GL11 5BH.
Price: £5.00

THIS is the opener of the adventure series written by Simon Hargrave, and although by his own admission the later titles are larger, faster and more complex, this is far from being a bad starting point.

The scenario of this text adventure is that you, in the role of the oddly named Kurgan Travis, are a 22nd century spacecraft pilot. Unfortunately poor old Kurgan is returning from a solo flight when his craft gets a battering from a meteor storm draining the ship's fuel rod. As there's no hard shoulder or car park in space an emergency stop is needed on a nearby planet. Looking out of the window you realise there's no intergalactic Esso station and the fuel rod needs recharging you also need to find the launch co-ordinates for earth — these are your problems to solve.

Emerging from your ship you realise that there not only is no petrol station, but very little else nearby although you can go initially west or south indicated by the fact that these directions are shown upon the screen in lowercase. The other non applicable directions remain on screen in standard text.

Also shown on the screen is a description of the location (there are 82 in total this may be his first adventure but its no small scale effort) and objects in eyeshot that you can get your hands on. The text has not been redesigned but this doesn't really alter the games atmosphere.

The immediate environment reveals very little except desert, but just enough however to take you across the chasm by unconventional methods as the old bridge collapses under your weight.

Once across the chasm the adventure really begins as you enter the base and here you have to be careful which buttons of the many on the walls that you press.

The base is a vast network of corridors with rooms branching off in all directions. There are laboratories, store rooms, pitch black rooms and communication centres. Also there are more relaxing rooms like the rest centre where you can take a well earned nap or the swimming pool where you can take a quiet dip — or can you?

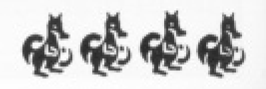
All in all there are 64 commands you can use one of which is Vlist, which displays them all on the screen as well as load and save options. Unlike later titles some words have to be entered in full rather than the first three letters, although all frequent commands such as directions look and press can be used by single letter entry.

The game is played in 'mock real time' so you don't get 'time passes' frequently flashing up but there is day and night with your number of moves recorded.

As for faults, well, its certainly slower that the other titles and certain locations are repeated several times. No major faults though.

Finally, all I can say is that as this is the first in the series, buy it first then progress through the series — they're supposed to get better and this is good!

Philip Stott



HACKING SHEET 2. Additions Welcome.It has not been possible to list loading methods for every game,but see sheet 1 for a key to those given.Methods may be different if you have a different version of the games.

PENGON-(C) 20 POKE 8743,(LIVES) or POKE 11633,125 (G)

THE DARK PIT-(C) 20 POKE 11255,(LIVES) or POKE 11567,125 (G) (F) during a game press the keys "P,8,L,M,C" then use the arrow keys and the enter key to select your screen, finally position your man and press enter to start.

RUBY ROBBA-(E) POKE22014,(LIVES) or POKE21117,125 (G)

MUTANT WARS-To load type "CLEAR 200,14999:SKIPF:SKIPF:CLOADM" then, POKE22013,(LIVES) or POKE 23000,125 (G) To run type EXEC

THE DEATH MINES OF SIRUS-The adventure passwords are "CBLW" and "TLL"

BEANSTALKER-(F) From the main menu press the keys "5,R,E,G,I,S,T,E,R,enter,N" you should now be back to the menu.Hold down the keys "enter","X" and "8" at the same time and you can access the screen designer.During a game (F) press "clear" and "N" to go onto the next screen or "clear" and "X" to gain extra lives to a maximum of 999.

THE BELLS (Keyboard)-(E) POKE 10729,(LIVES) or POKE8518,18 (G)

THE BELLS (Joystick)-(E) POKE 9390,(LIVES)

BLOC HEAD-(C) 20 POKE 10536,(LIVES)

MONSTERS-(E) POKE23628,(LIVES)

ICE CASTLES-(C) 20 POKE 19160,(LIVES)

BUBBLE BUSTER-(D) during a game. POKE5161,(LIVES=5) and/or POKE7301,125 (Infinite lives) Run with EXEC 7686

TUBEWAY ARMY-POKE 12367,(LIVES) and POKE 12388,(START STAGE)

NINJA WARRIOR-(E) POKE 9489,(LIVES)

CHAMBERS-POKE 13339,(LIVES)

ROMMELS REVENGE-POKE 16516,(LIVES=Not many)

CUTHBERT IN SPACE-POKE 7573,(LIVES)

ROBIN HOOD-(C) 20 POKE 15712,(LIVES=127)

MINED OUT-Insert "EXEC30700:" before the RETURN at the end of line 80 to display mines during play, or change line 203 to read "A=8:FORI=1 TO A-1" thereafter reaching screen 3 or higher gives a choice of any starting screen.

ROMMEL 3D-(C) 20 POKE14747,(LIVES=11)

CHUCKIE EGG-(B) POKE22312,255:EXEC 16640 then when OK appears, EXEC again. This adds extra fun by enabling the man to jump to the above platform (BE CAREFUL!)

MANIC MINER-(F) during a game press the keys "P,W,E,N,G,U,I,N" (Just press the "W" quickly).If you are successful a boot should appear in the bottom right hand corner. You can now press "break" followed by a letter "A" to "V" to select your screen. For the below program type it in substituting LIVES for the number of lives you want,SCREEN for the screen number which you would like to start on,and INF for 125 if you want infinite lives or 122 for a normal game. Once you have typed the program ,type RUN then EXEC 171 "10 READM:POKEX+171,M:X=X+1:IF X<25 THEN 10 20 DATA 16,206,0,255,189,160,146,134,LIVES,183,51,90,134,SCREEN-1,183,51,76,134,INF,183,51,178,126,1,103"

JET SET WILLY-(F) during a game hold down the keys "M","A" and "X" at the same time, then select your screen using left, right and space.Finally position your man and press space again.The first of the programs below gives infinite lives and the other gives total immunity. Once typed in, type RUN then EXEC 171. "10 READM:POKEX+171,M:X=X+1:IF X<15 THEN10 20 DATA 16,206,0,255,189,160,146,134,125,183,43,8,126,9,9" "10 READM:POKEX+171,M:X=X+1:IF X<22 THEN 10 20DATA 16,206,0,255,189,160,146,204,125,57,183,43,8,183,43,11,247,43,20,126,9,9"

QUAZIMODO-POKE 15644,(LIVES)

GALACTIC RAIDERS-POKE 19664,(LIVES)

COSMIC CRUISER-To load type "SKIPF:SKIPF:CLOADM:POKE9398,(LIVES):EXEC"

THE DRAGON COMPOSER-For a basic stop after every note, change line 533 so that there is a RETURN on the end not a GOTO 530. Next, add the following lines "529 GOTO 531 530GOSUB533 531READNSØ:IF NSØ="DONE" THEN 830"

SKRAMBLE-(A) Once loaded type any of the below pokes, then EXEC 4096. POKE 7300,(LIVES)(1) POKE7294,(LIVES)(2) POKE7301,(STAGE)(1) POKE7295,(STAGE)(2) POKE7429,125:POKE10108,125 (G)(1)

WHIRLYBIRD RUN-(E) POKE 8312,(LIVES) and POKE 8307,(STAGE)

DUNGEON RAID-(F) Press "C" to start each new game and you will continue from where the last game ended, not the beginning.

ARCADIA-CLOAD the basic as normal, then add "75 POKE 12508,(LIVES=127)" before typing RUN. One player joystick version only.

CHAMPIONS-Change line 50 to read "50 CA=1000000:CZ=0:DI=1".This causes a starting money of £1m and 1st division place at the start.original champs only.

EDDIE STEADY GO-(A) POKE27152,(LIVES):EXEC27170 Press RESET when cassette stops again. (F) Select joystick. Type "FIDDLE" at the start of each game and you can change the screen with the arrow keys.

CAVE FIGHTER-POKE 27078,(LIVES)

THE KING-"SKIFF:CLOADM:FORX=12850 TO 12894: POKEX,255:NEXT:EXEC" This gives hundreds of lives.

SPACE RAIDERS-(A) POKE 23304,(LIVES=45):EXEC 16384

CU*BER-POKE10454,(LIVES)

Issue II. Updated 7/2/87. Many thanks to all the contributors.

Pamcodes

Part two of our series on machine code by **Pam D'Arcy**

COPYING machine code examples from books and magazines can be a ninefield at the best of times, let alone for a beginner. The example may use a different assembler from yours. The principle difference is likely to be in the make-up of label names, so adaptation of the source code to suit your assembler's rules should not be too difficult. There certainly have been assemblers on the market that do not support all the available types of source code instruction (like the first one I purchased for more than twenty pounds). Life was nigh impossible until I gave in and ditched it for a much cheaper, much better (and still available and supported) assembler package. If you find that you simply cnanot obtain an error free assemble of some instructions, or cannot obtain the expected object code despite following the assembler's rules and can get no satisfaction from the software publisher, seriously consider cutting your losses and starting again with a better supported assembler. having the right tools for the job gives you the best start of all.

A more difficult problem to cope with is if the source code is written in such a way that the program will only successfully execute if it is loaded at a particular address in memory. This is known as position dependent, or non-relocatable code and poses a problem if it clashes with the memory occupied by the assembler itself or, perhaps, disc workspace. Printing errors provide a further hindrance. One can probably cope with correcting a printing error in a Basic program, but where does one start with assembler program misprints?

If I have deterred you further with that catalogue of woe, take heart, as with this series of articles I have high hopes of helping you to understand what is going on within any piece of machine code, so that you can work out what, if any, changes you need to make to get it to work on your system.

Return to sender

There is a very important instruction when using machine code: RTS. ReTurn from Subroutine is its official description, but having just come up with the above heading to describe this paragraph, I think that Return To Sender is perhaps a more apt way of thinking of it. To execute machine code, one can use the USR or EXEC functions from within a Basic program or use EXEC direct from the keyboard (= common mode). In the same way that an assembler takes source code and converts it to machine code instructions, Basic programs are a form of source code that the Basic ROM has been designed to interpret and carry out the functions required with equivalent machine code instruction. When the Basic ROM is asked to EXEC or carry out a USR function, it will perform a

JSR 'address'

machine code instruction (Jump to SubRoutine) and will continue executing instruction after instruction until it meets an RTS (ReTurn from Subroutine) instruction that returns it to the next machine code instruction following the JSR instruction. In the instance being described here, that is within the Basic interpreter ROM, if the machine code has been called from within a Basic program, it will then return to the Basic program at the statement following the EXEC or USR function or, if EXEC was typed in from the keyboard in command mode, will display OK to advise you that the machine code called by the EXEC command has been carried out and the Dragon is ready to receive your next command. Woe betide you if you forget to ask you machine code to 'Return To Sender' after it has completed its process, as the unknowing Dragon will treat the content of the next byte as a further machine code instruction ... and the next byte ... and the next byte ...

Try:

```
CLEAR 200,&H6600
POKE &H6600,&H39
EXEC &H6600
```

(39 is the value in hexadecimal of the generated object code for an RTS instruction.) With these commands, you will have entered a machine code 'program' — albeit a single RTS instruction — and returned successfully from it.

Switch off and remove anything from your system that could become corrupted (eg the discs). Switch on and try an EXEC to any address you care for — you may be lucky and get an 'OK' without apparent ill effect — or you may effect a spectacular system crash. That is the effect of executing machine code that does not terminate with a Return To Sender instruction — the Dragon careers on as if you have asked it to carry out those 'instructions' beyond the true end of your code and who knows what might happen?

Using ROM routines

It is very useful to use the existing Basic ROM routines for some functions. THis in particular avoids having to understand how to communicate with the world outside the Dragon until we feel ready to investigate and confident enough to experiment. As well as saving time by not having to design, code and test our own code for such functions, it reduces the memory requirements of our own programs by not duplicating existing code. I shall refer to using the ROM routines as 'calling a ROM routine' or something similar — in much the same way that unless it is qualified further, any references I make to program, routine, subroutine or module simply mean a lump of machine code.

Many machine code programs and examples use ROM calls. These can be recognised by JSR instructions

JSR 'address'

where 'address' is in the range \$8000-\$BFFF. If you are running a Dragon 64 in 64K mode, set your alarm bells jangling immediately and look for this type of (32K mode) ROM call as you will basically need to add \$4000 to such addresses. However, this only holds true as far as address \$B39B (page 341 of Smeed and Somerville's *Inside the Dragon*). Although I have never seen it in print, thanks to a *Dragon User* reader I believe that beyond that point, the value to be added is \$3F00. I will be gearing the articles to the 32K mode ROM.

To execute correctly, called ROM routines may need additional information which may be provided in a combination of registers and/or fixed (Basic workspace) memory locations. Brian Cadge's 'firmware' series (September 1985 — April 1986) and *Dragon Answers* column are valuable sources for Basic ROM information.

CLEAR SCREEN is a ROM call that doesn't need any additional information. Its address is \$BA77 (November 1985 issue) — so EXEC &HBA77 typed in from the keyboard would clear the screen, OK appearing at the top left being the Basic interpreter's confirmation that the command you requested has been completed and it is ready to receive further input. Basic programs

```
10 CLS
```

or

```
10 EXEC &HBA77
```

would give the same result.

The ROM call used in last month's article (&83F3) is not listed in Brian's series — it may well be one of those ROM calls that has been 'discovered' by someone disassembling the Basic interpreter or revealed by those with 'inside information' as it is probably a routine called by the interpreter when we are editing a Basic program. It also falls in the category of needing additional information for it to perform correctly — namely register X set accordinly. I am not going to discuss how the ROM routine does what it does — but, at last, I am going to discuss some machine code instructions!

Programming

Programming is the manipulation of data or information. A few machine code instructions act directly upon memory

locations but, on the whole, the data is manipulated in registers or accumulators by copying (otherwise known as loading) the contents of a memory location or two into a register, carrying out a function on it and copying (or storing) the result back in the same or different memory location(s). Data can only be moved to different places in memory via the registers.

There are two sizes of register in the Dragon: single byte (or 8-bit) that can hold a value up to 255 ($FF) and double byte (or 16-bit) that can hold a value up to 65535 ($FFFF).

The single byte registers are:

B

DP (Direct Page)

CCR (Condition Code Register)

Double byte registers (also known as index registers) are:

X

Y

U

SP (hardware Stack Pointer)

PC (Program Counter)

Additionally, registers A and B can be treated as a double byte unit, named D. Altering other than registers A, B, (D), X and Y can have a disasterous effect on your program unless you know what you are doing — so don't touch them until you have some understanding of their special functions (how far into the New Year did you say I could run this series, Ed?)

When STored data, obviously the operand always represents a memory address. The LoaD and arithmetic instructions differ, however, in that the operand may be an actual value rather than the contents of a memory location. The use of an actual value (sometimes known as preset data) is recognised by the operand commencing with a hash (#) symbol:

LDA #3

ADDB #5

LDD #'OK'

This can often be a source of error in coding as if one omits the #, the contents of that memory location will be used — and who knows what that memory might contain when your program is executing?

Depending on how you wish to count, there are several ways of specifying the source/destination memory address in the operand column. Once you have mastered how to evaluate what address is involved in any machine code routine, you will be a long way towards your goal as you will be able to recognise where code will not suit your system and amend it accordingly.

To me, these memory variations boil down to three and a half ways, or modes:

Extended — actual (= fixed) address

Indexed — an address has been previously loaded into a register and may be further qualified by the contents of registers A, B or D or by a fixed value (known as constant offset) or +,- symbols.

Indirect — a lesser used method — both extended and indexed may additionally be indirect — acting upon the address in an address, as will be touched on below.

Direct — the 'half' method that, apart from being faster to execute and generating less object code than extended mode instruction, only has real significance if programs manipulate the DP register.

Last month's 'program' contained an example of direct, extended and indexed modes of addressing in only the first three lines of code!

Direct mode or base page addressing

It just may be that the assembler you are using does not support this mode of addressing. If certain of last month's instructions generated different machine code, thus:

```
BE0019 LDX $19
BF001B STX $1B
BF001D STX $1D
BF001F STX $1F
```

it means that your assembler is one of these and will translate instructions as extended types. For the moment, apart from accepting that generated code may differ from that appearing in these articles, ignore this omission from your assembler.

If you are the owner of an assembler that allows you to 'force' modes, you will be able to duplicate the above generated object code by following the assembler's instructions (eg using Dream, preceding the operand with 〉 will force extended mode — I bet you always wondered what the 〈 〉 symbols were for!).

Memory addresses are always 16 bits or double byte values. How direct mode actually arrives at the memory address in question is that it prefixes the value generated by the operand (which is never 〉$FF = never 〉8 bits) with the contents of the 8-bit DP register:

STX $19

if the DP register contains $00, the contents of Register X are stored starting at address $0019 in memory; if the DP register contains $60, the contents of Register X are stored starting at address $6019 in memory.

The Basic interpreter contains many direct mode instructions, so if calling ROM routines from machine code that has altered the contents of the DP register, it needs to be reset to null ($00) prior to calling a ROM routine to ensure satisfactory results.

For now, we will not touch the DP register so it will remain at its default value of $00. If your assembler supports direct mode instructions, any operands containing an actual memory address of not more than $FF will generate direct mode object code unless you intervene by forcing extended mode.

Extended mode

Assemblers not supporting direct mode will automatically generate extended mode code for operands containing an actual memory address. Assemblers supporting direct mode will automatically generate extended mode code where the memory address in the operand exceeds 8 bits (〉$FF). Extended mode, then, contains the full 16 bit = double byte address in its generated object code. JSR $83F3 in last month's code is an example of this.

Indexed mode

This is where a memory address has already been loaded into one of the index registers (X, Y, U, SP, PC) and memory is being accessed using that register — which may be further qualified by the contents of registers A, B or D or by a fixed value (known as constant offset) or +,- symbols. For the moment we will ignore the indexed mode instruction of last month's code (LEAX 2,X) as the Load Effective Address (LEA) instruction is (so soon?) a special case.

For the following example, we will assume that memory contains:

```
$6000 $0A
$6001 $05
$6002 $00
$6003 $01
$6004 $FF
$6005 $08
```

Load actual memory address $6003 into register X. (LDX #$6003)

When ,Register appears in the operand, the actual address is calculated by the processor before the instruction is carried out, eg:

LDA ,X or LDA 0,X

copies into register A the contents of the 8 bits, or byte, of the memory address contained in register X plus null or no offset:

X=$6006 so

LDA ,X or LDA 0,X

will copy into register A the contents of memory location $6003=$01.

The range of the offest can be up to +32767 or -32768. With the value $6003 in register X, what will be the contents of registers A and B after

```
LDA 1,X
LDA -1,X
```

I hope you arrived at $FF and $00 respectively.

Register offset

Register A or B or the combined unit D can be used as the offset. if register A or B is

used, the offset (= contents of the register) can be in the range +127 to -128; register D can contain offsets in the range +32767 to -32768.

Keeping with register X containing the value $6003, can you hazard a guess as to what happens with

```
LDA -1,X
LDB ,X
LDD D,X
```

LDA -1,X will copy the contents of ($6003-1) into register A, +$00. LDB ,X will copy the contents of $6003 ($6003+0) into register B, =$01. Looked at as a double byte unit, registers A and B = register D = contains $0001.

The amount of data involved (one byte or two) depends on the size of the register being loaded or stored. Registers A and B (and DP and CCR) each accommodate a single byte. Register D and the remaining registers accommodate two bytes.

LDD will copy the two bytes of memory starting at the computed, or calculated, address into register D.

Register D contains 1 ($0001)
Register X contains $6003

therefore LDD D,X will copy into register D the two bytes starting at location $6004 ($6003 (X) plus an offset of 1 (current contents of D)). Thus LDD D,X at this point will load the value $FF08 into register D ($FF in register A, $08 in register B).

I will leave the +,- index options (auto increment/decrement) and indirect mode to an article when we use them.

Arithmetic using LEA

Load Effect Address (LEA) is a most powerful instruction in creating Position Independent Code (PIC), briefly mentioned last month. It can also be used for arithmetic in the Index Registers by using it in indexed mode as used in last month's example, LEAX 2,X. This loads into register X (leaX) the computed value of the operand — adding the given offset to the current contents of register X. THus is stops short of the LoaD instructions above that to on to load the contents of the computed address into the destination (mnemonic) register. Thus if register X is still loaded as above ($6003), LEAX 2,X will increase the value in register X by 2, to $6005. The destination register does not need to be the same as the operand. For instance, in LEAY 2,X if X contains $6003 will result in the computed value ($6005) being loaded into register Y and register being left unchanged.

A final look at last month's code

Now you know exactly what was going on outside the ROM call, don't you?!!

LDX $19

Copy the two bytes starting at address $0019 (= $0019 and $001A) into register X. (This is actually the memory address of the start of the current Basic text program in memory.)

JSR $83F3

Jump to the subroutine starting at the actual memory address $83F3. (It then stays in the Basic ROM until directed back to our next instruction by an RTS.)

LEAX 2,X

The ROM routine returns to our code with the memory address of the end of the Basic program contained in register X. The rest of our 'rescue' program needs to set up further pointers that the interpreter needs when RUNning the program. These pointers are all the same value, namely the memory address of the end of the Basic program plus 2.

```
STX $1B
STX $1D
STX $1F
```

Copy the double byte contents of register X into memory locations $001B, $001C then the same value into $001D,$001E then again into $001F,$0020, Many books detail what the contents of these locations represent.

Workout

Articles will no doubt get longer as we progress but, step by step at the moment. If I tell you that to display a character on the normal text screen, you can load the character into register A and call ROM routine $800C, simply by loading a character, display, load a character, display etc., write a program to display your name in the top left hand corner of the screen. Don't forget to Return To Sender!

Crossword

OK, all you self-professed non-intellectuals. You want a competition which doesn't require advanced programming skills. Here it is. We won't actually duff you up if you want to do T & D's crossword purely for your private pleasure, but there will be a couple of free tapes from the Editor's Magic Bottomless Box for the first correct entries to reach us each month.

You can even try telling us which tapes you'd like in an ideal world. No promises. It all depends on what we have in stock.

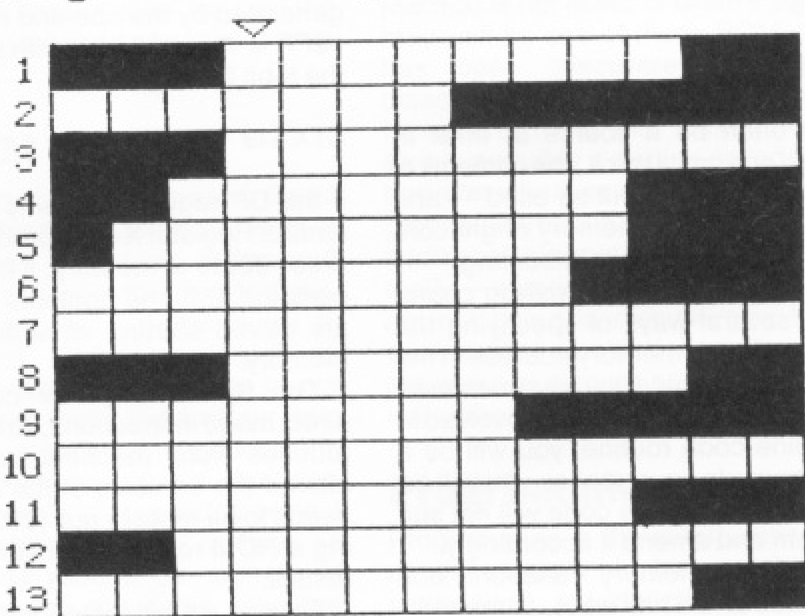
And you don't have to cut up your *Dragon User* either — heaven forbid! Entries can be written out on a photostat or a plain piece of paper, as long as we can read'em.

And no tie-breakers!

1. Take a bad time, right from a pal, for a horror down below! (3,5)
2. Shakesperian board game? (7)
3. Radio belle rings for Mexican devil! (2,8)
4. Strip elms bark in a mad rush (8)
5. Snore with zeal here, and you might get burned! (5,4)
6. Battle of the misfits? (6,3)
7. Does he compose multicoloured stories? (7,6)
8. Would own land do you? (8)
9. More cops for Bach or Elgar! (8)
10. A lion's hamster learning martial arts! (7,6)
11. Ruler of four-legged fools! (6,4)
12. Bill's a flier in high society! (3,3,5)
13. Invasion by phantoms (5,6)



All this month's answers are names of Dragon software. When the crossword is complete, the column marked with an arrow will spell out a phrase.



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DR64

64 Columns

***Paul Harrison** does an upgrade on the Dragon screen display*

64-COL is a program which attempts to cure one thing which makes the Dragon inferior to many home computers of its class — the screen display. The table below lists several problems that Dragon Data created when they decided to use the Motorola board on which the Dragon was based too closely:

* There is no lowercase.
* You cannot redefine text.
* The screen is limited to 32 columns of 16 characters — which is almost unusable.
* There is no decent way of mixing text with hi-resolution graphics.
* Inverse text is not properly provided for.

Had Dragon Data changed the poor quality 6847 video display chip to (for example) the 6845 (as used in the BBC micro and the IBM Colour Graphics Adapter), the Dragon would have been capable of a great many other things — 16 colours, flashing colours, 80 column text, 640x256 resolution, etc. All this seems ridiculous in a micro with probably the best graphics facilities out of all the home micros today.

Unfortuntately, it is difficult to connect another VDG to your Dragon. However, if you use a few tricks involving the low quality of the standard television set, and the expandability of the system software-wise due to the useful vectors provided by Microsoft, you can get 64 column text on the computer, allowing an amazing three times the amount of data on the screen at any time! Because the program to do this is stored in the RAM, you can redefine text as well, and . . . wait for it . . . you can (at last) have lowercase on the Dragon!

This is exactly what my program does. The screen mode it uses is PMODE-4 so you can mix hi-res graphics and text on the screen at the same time. The character size is 4x7, allowing 64 columns of 27 lines to be used. Unlike some other text utilities, facilities like a visible cursor are provided, when you are typing in text or while a program is running (this feature is possible to turn off). There are control codes for inverse text, for non destructive backspace and forward space, to make the screen scroll without effecting the cursor position, and the usual Dragon control for delete and the carriage-return/line feed sequence.

The table below summerises the effects of the controol codes:

0 No operation (NULL)
1 Non-destructive backspace (BS)
2 Non-destructive forward-space (HT)
3 No operation
4 Scroll (does not effect cursor position)
5 Enable cursor
6 Disable cursor
7 No operation
8 Delete (DEL)
9 No operation
10 No operation
11 No operation
12 Clear screen (FF)
13 Carriage return/line feed (CR/LF)
14 Home cursor
15 Inverse off (use white on black characters) These also effect the scroll and form-feed colours.
16 Inverse on (use black on white characters)

Facilities have been provided for machine code programmers to increase the number of codes provided. There is a vector at the end of the program (location 31108) which can be patched, either by over writing it to by placing a jump at the location to a subroutine of your own. At this point, 'A' holds the current character (below 20 only) and any control characters that need to be interpreted, will have. Note though that you can still check for these characters, your routines being executed after the ones in the 64-Col program itself.

As a rough guide to the whereabouts of spare memory, you can write your routine in the space between 31108 and #7BFF without any problems.

The Character Set

There are 128 displayable character altogether-lying from #20 (space) to #9F. Characters above £9F are stored in the ROM and print out as rubbish. Characters are stored as 8 bytes (although only the first 7 bytes are displayed). As each line of each character has only 4 bits, the characters have two forms — one, which is printed for every odd column, uses the top 4 bits of each byte, and one for every even column, which uses the lower 4 bits of the bytes that make up the character. This turned out to be the easiest way of doing it, and a programmer could easily find ways of taking advantage of this.

The characters between #80 (£128) and free for you to redefine. You can redefine the others as well, but you may get some funny results if you do (can you imagine a listing where all the Es are printed as space invaders ???!?). You can calculate the position of the first byte of a character by using the equation 8*c+&H7B00, where 'c' is the ASCII code of the character to be changed.

An easy way of redefining characters is by using **listing 3**. This runs using 64-Col and allows you to define characters using a grid, and a cursor that can move around the grid changing individual bits. The computer will display the codes that make up the character at the side of each line of the character, so that when you have finished, you can write them down and use them in another program.

To demonstrate how this is done, you could using the following subroutine to define character 130 as a box.

```
1000 LET CHARACTER=8*130+&H7B00
1010 LET A*="F99999F":
  REM THE CODES THAT MAKE UP THE
  CHARACTER
1020 FOR N=1 TO 7
1030 X$="&H"+STRING$
  (MID$(A$,N,1),2)
1040 POKE CHARACTER+1,VAL(X$)
1050 NEXT N
1060 RETURN
```

Typing in the program

Listing 1 is the only listing you have to type in. **Listing 2** is a very useful character designer (see above).

After you have typed in routine 1, CSAVE the program to tape, and then RUN it. You are bound to have made some typing mistakes, even I, mega-brilliant as I am, do that sort of thing. The computer will tell you where any mistakes have been made, and stop. You can then edit the appropriate line, and correct it. Once the program has all the typing mistakes out of it, it will set itself up for white on black text, with a cursor. The computer will clear the screen, and print the entire ASCII range (#20 to #7F).

The following Basic instructions have no effect:

* CLS
* TAB (x) and ','
* SET/RESET (Use PSET and PRESET instead)
* PRINT@x, (the text will be printed at the current cursor position).

The equivalant of the instruction PRINT AT x,y; is PRINT CHR$(14);STRING$ (y,13);STRING$(x,2);

It is not a good idea to use graphics if the cursor has been switched on as it expects the screen to be the same as when it left it, and if you draw lines through the cursor, lines will appear/disappear where the cursor was beforehand.

I have not decided to produce a program that is compatible with most standard Dragon programs, as it would be difficult, if not impossible for them to make full use of the new screen size. Any programs not designed to run on this system will therefore be unlikely to work.



```
10 DATA B603F9C6E03DC306001E10B603F8473086B603F8C60F85012602C6F01F98,3291
20 DATA 5339B603FB85012715BD7800C607B703FDA800A70030882 0B603FD5A26F3,3083
30 DATA 39C607F703FFB603FC8020C6083DC37C001F02BD7800B703FDF703FEA6A0,3561
40 DATA B803FAB403FDE600F403FEE700AA00A7003088207A03FF26E5398E0600A6,3406
50 DATA 8900E0A7808C1D2025F5B603FAA7808C1E0025F9397F03F8B603F94C811B,3426
60 DATA 2505BD7874861AB703F939B603F84CB703F881402503BD788D39B603F84A,3309
70 DATA 2B04B703F839863FB703F87D03F927037A03F939BD78B08620B703FCBD78,3417
80 DATA 3D8608B703FC398601BA03FBB703FB3986FEB403FBB703FB398E0600B603,3416
90 DATA FAA7808C1E0025F97F03F87F03F939B603FC810D26037E788D810826037E,3126
100 DATA 78C88101260 37E78B081022603 7E78A18104260 37E787481052603 7E78D9,2666
110 DATA 810626037E78E2810C26037E78EB810E26037E78F87E79727D006F270139,2683
120 DATA 7F00897C008934 16B703FCBD7820B603FC8120250BBD783DBD78A1BD7820,3205
130 DATA 35B6BD78FFBD782035B6810F26047F03FA398110 26077F03FA7303FA3939,3050
140 DATA 39392020202020202020202020202020202020202020202020202020202020,1010
150 DATA @@@,0
160 DATA 00000000,44440400,AA000000,688C8E00,4ECE6E40,A2448A00,4A4AA700,4400
0000,24444420,84444480,00A4A000,044E4400,00000480,000E0000,00000400,22448800
,4AAAA400,4C444E00,4A248E00,C2C22C00,26AF2200,E8C22C00,68CAAC00,E2488800,4A4
AA400,6AA62C00
170 DATA 04004000,04004800,02484200,00E0E000,08424800,4A240400,F1DD5700,4AAE
AA0C,CACAAC00,68888600,CAAAAC00,E8E88E00,E8E88800,688AAE00,AAEAAA00,E4444E00
,F2222C00,AACAAA00,88888E00,AEAAAA00,8CAAAA00,EAAAAE00,EAAE8800,4AAAAF00,CAA
CAA00,68422C00
180 DATA E4444400,AAAAAE00,AAAAC800,AAAAEA00,AA44AA00,AAA44400,E2448E00,E888
8E00,88442200,E2222E00,04A00000,000000E0,04EE4000,0C2EAE00,88EAAE00,00E88E00
,22EAAE00,00EE8E00,68E88800,00EAE2E0,88EAAA00,40C44E00,40E44C00,88ACAA00,C44
44E00,00EEAA00
190 DATA 00CAAA00,00EAAE00,00EAE880,00EAE220,00E88800,006C6C00,8E888E00,00AA
AE00,00AA4400,00AAEA00,00A4AA00,00AA4800,00E24E00,24484420,44444440,84424480
,5A000000,5A5A5AA0,CAC2B74D,@@@
500 PCLEAR 4:CLEAR 1024,&H7800
510 X=&H7800
520 L=10:ERR=0
530 CLS:PRINT CHR$(12);"LOADING 64-COL... PLEASE WAIT."
540 C=0:READ X$,CH:IF X$="@@@" THEN 600
545 H$=LEFT$(X$,2):X$=MID$(X$,3)
550 H=VAL("&H"+H$):POKE X,H:X=X+1:C=C+H
560 IF X$<>"" THEN 545
565 IF C<>CH THEN PRINT "LINE ";L;" IS FAULTY. RECHECK":ERR=-1
590 L=L+10:GOTO 540
600 IF ERR THEN END
610 CLS:PRINTCHR$(12)"LOADING CHARACTER SET."
620 X=&H7C00
630 READ X$:IF X$="@@@" THEN 700
640 FOR B=0 TO 7:Y$=MID$(X$,B+1,1):Y=VAL("&H"+Y$+Y$):POKE X+B,Y:NEXT
650 X=X+8
660 GOTO 630
700 POKE 360,121:POKE 361,68:POKE 359,126
710 PMODE 4:SCREEN 1,1:PRINT CHR$(15)CHR$(12)CHR$(6)"64-COL:       64 Column
text adapter for DRAGON-32":PRINT"Version 1.1. by Paul Harrison.":PRINT"POKE
 359,57 to disable."
720 X=0:Y=6
730 FOR A=32 TO 127
740 PRINT CHR$(14);STRING$(Y,13);STRING$(X,2);HEX$(A);" ... ";CHR$(A);:Y=Y+1
:IF Y>25 THEN Y=6:X=X+12
750 NEXT A
790 PRINT CHR$(5);CHR$(14);STRING$(3,13);
```

Listing 1.

'64-Col' loader program.

```
10 PRINT CHR$(15);CHR$(12)"Character designer"
20 IF PEEK(360)<>121 THEN PRINT"ERROR-64C0l must be installed be
fore running this program.":END
30 CH=128:DIM C$(4,7),R(7),SP(100)
40 PRINT CHR$(6)
100 GOSUB 1000
110 GOSUB 2000:GOSUB 3000
120 FOR A=1 TO 7:PRINT CHR$(4);STRING$(8+A*2.286,13);STRING$(48,
2);HEX$(R(A));" ";:NEXT
200 PRINT CHR$(14);STRING$(10,13);"CHARACTER:";CH:PRINT"CHR$(";C
H;")=";CHR$(CH)
210 FOR A=1 TO 4:FOR B=1 TO 7:PSET(A+240,B+128,-(C$(A,B)="S"))
220 NEXT B,A
230 PRINT CHR$(14);STRING$(8+Y*2.286,13);STRING$(48,2);HEX$(R(Y)
);" ";
300 XX=16*X+82:YY=16*Y+50:PUT(XX,YY)-(XX+13,YY+13),SP,NOT
310 I$=INKEY$:PUT(XX,YY)-(XX+13,YY+13),SP,NOT:IF I$="" THEN 300
320 IF I$="1" THEN PRINT CHR$(6);:END
330 IF I$="2" THEN 100 ELSE IF I$="3" THEN 500 ELSE IF I$="4" TH
EN 600 ELSE IF I$="5" THEN 700
350 X=X+(I$=CHR$(8)ANDX>1)-(I$=CHR$(9)ANDX<4):Y=Y+(I$=CHR$(94)AN
DY>1)-(I$=CHR$(10)ANDY<7):IF I$<>CHR$(13) AND I$<>CHR$(12) THEN
300
400 IF I$=CHR$(13) THEN 450
410 C$(X,Y)="R":R(Y)=(255-2^(4-X)-2^(8-X))ANDR(Y)
420  LINE (XX,YY)-(XX+13,YY+13),PRESET,BF:GOTO 200
450 C$(X,Y)="S":R(Y)=(2^(4-X)+2^(8-X))OR R(Y)
460 LINE(XX,YY)-(XX+13,YY+13),PSET,BF
470 GOTO 200
500 FOR A=1 TO 7:POKE CH*8+&H7AFF+A,R(A):NEXT
510 LINEINPUT"Enter '£' followed by the code of the character yo
u now want to define, or '$' followed by the character itself yo
u wish to define. .....>";A$
520 IF LEN(A$)<2 OR (LEFT$(A$,1)<>"£"ANDLEFT$(A$,1)<>"$")THEN 51
0
530 IF LEFT$(A$,1)="£"THENCH=VAL(MID$(A$,2)) ELSE CH=ASC(MID$(A$,2))
540 IF CH<32 OR CH>159 THEN 510 ELSE 100
600 FOR A=1 TO 7:R(A)=0:FOR B=1 TO 4:C$(B,A)="R":NEXT B,A:GOSUB
3000:GOTO 120
700 FOR A=1 TO 7:R(A)=255-R(A):FOR B=1 TO 4:IF C$(B,A)="R" THEN
C$(B,A)="S" ELSE C$(B,A)="R"
710 NEXT B,A:GOSUB 3000:GOTO 120
1000 PMODE 4:COLOR 1,0:PCLS:PRINT CHR$(14)"Character designer- M
enu":LINE(96,64)-(160,178),PSET,B
1005 PRINT"1) Quit":PRINT"2) Get old character pattern":PRINT"3)
 Accept pattern and select new character":PRINT"4) Clear pattern
":PRINT"5) Invert pattern":PRINT"Use arrow keys to move,ENTER to
 set point, and CLEAR to clear   point."
1006 X=1:Y=1:FOR A=96 TO 160 STEP 16:LINE(A,64)-(A,178),PSET:NEXT
1030 FOR A=64 TO 178 STEP16:LINE(96,A)-(160,A),PSET:NEXT:RETURN
2000 PS=8*CH+&H7B00:FOR A=1 TO7:B=PEEK(PS):PS=PS+1:R(A)=B
2030 FOR C=1 TO 4:IF (2^(4-C)ANDB)<>0 THEN C$(C,A)="S" ELSE C$(C
,A)="R"
2040 NEXT C,A:RETURN
3000 FOR A=1 TO 4:XX=82+16*A:FORB=1 TO7:YY=50+16*B
3020 IF C$(A,B)="S" THEN LINE(XX,YY)-(XX+13,YY+13),PRESET,BF
3030 NEXT B,A
```

Listing 2: Type '#' for '£'.

Music Editor

***D. Diggins** tunes up his Dragon note by note*

MUSIC editor is a utility program which allows the user to input music, edit it, play it and do various other things with it. The program itself is a similar to a filing program, where you input each file which contains six fields, these being the note, tempo, octave, volume, length and pause, then you can alter them. The only difference is that the files are strings of notes which you play. You can input up to 197 files, but if you feel you need more then you can easily alter this by changing the line numbers which concern the number of files.

When the program is run, you are faced with a menu of nine options. A flashing cursor will wait for your to make your choice. If you haven't put any files in and you press numbers 3 to 9, you will get no response.

OPTION 1: **Create a new file**
When you first run the program you do not need to use this option, it is really a means of getting rid of the old file and starting again. If you press this accidently, don't worry because the computer will ask if you were sure you wanted to start again.

OPTION 2: **Add a note to file**
Enter the appropriate value for each heading and press enter after each heading. Pressing the left cursor will rub the last input out and let you input it again. Pressing clear will return you to menu. If you press enter and you had not input a value then the last value from the last file will be copied to the file that you are entering now. If you press enter and value disappears, this means the value you input was either too big or too small. The values that are acceptable are:-

NOTE....A — G
TEMPO...1 — 255
OCTAVE..1 — 5
VOLUME..1 — 31
LENGTH..1 — 255
PAUSE...1 — 255

OPTION 3: **Edit mode**
This mode allows you to alter any errors that you may have made. Press the up and down arrow keys to move the cursor up and down, pressing these with the shift key will move you up or down a page at a time. Press A for add, and all the notes after the cursor will move down one and a space will appear next to the cursor where you can input the new note. Press D and this will delete the note next to the cursor. When you have moved the cursor next to a file that you want to change press 'P' to amend and this will allow you to alter any mistakes or input values if you pressed A to add a file. Pressing the left or right cursor key will move the cursor, then when you are next to the place which you want to change press A then input the value, followed by return. Press S will mark the beginning ofl the block and press F for the end of the block, both these two keys are used to control option 5. Press M to return back to the menu.

OPTION 4: **Play music file**
This will play any music that has been put into the file. If the computer comes across a file where one of the parameters hasn't been filled in then it will return to menu. All options that concern the playing of the music will return to the menu if this happens. Press A will abort the option and return to menu.

OPTION 5: **Block play**
This will play the block of music specified by the user in Edit mode. If no block was made then the first note will only be played.

OPTION 6: **Print and play**
There are two options in this mode. The first one will print the note and play it, but will wait for the user to press a key before it plays the next note. The second option works the same as the first except the computer carries on playing without waiting for a key to be pressed.

OPTION 7: **Saving a file to tape**
This allows the user to save the file to tape.

OPTION 8: **Load a file from tape**
This allows the user to load a previously saved file from tape.

OPTION 9: **Printing the file**
This will print out the file to a printer (if one is connected), and any width from 52 characters upwards will be sufficient.

```
10 REM ************************
20 REM ***** MUSIC EDITOR *****
30 REM *****      BY      *****
40 REM *****   D.DIGGINS  *****
50 REM ************************
60 CLS0
70 REM PRESS RESET BUTTON BEFORE SAVING
80 POKE&HFFD7,0
90 REM setup
100 DATA 6,65,71,11,48,57,15,48,57,19,48,57,23,48,57,27,48,57
110 INC=0
120 DIM PP(6,3):FOR I=1 TO 6:READ PP(I,1):READ PP(I,2):READ PP(I,3):NEXTI
130 BL$="    "
140 PAGE=1:N=1:ST=1:EN=1:DIM N$(200,6)
150 FORI=1 TO 196:N$(I,1)="":N$(I,2)="0":N$(I,2)="0":N$(I,3)="0":N$(I,4)="0":N$(I,5)="0":N$(I,6)="0"
160 NEXTI
170 N$(0,1)="A":N$(0,2)="6":N$(0,3)="3":N$(0,4)="15":N$(0,5)="6":N$(0,6)="6"
180 B$=CHR$(128)
190 CLS0:PRINT@10,"music"B$"editor";
200 PRINT@76,"m"B$"e"B$"n"B$"u";
210 PRINT@98,"1. CREATE A NEW MUSIC FILE.";
220 PRINT@130,"2. ADD A NOTE TO FILE.     ";
230 PRINT@162,"3. EDIT MODE.              ";
240 PRINT@194,"4. PLAY MUSIC FILE.        ";
250 PRINT@226,"5. BLOCK PLAY.             ";
```

Continued

```
260 PRINT@258,"6. PRINT AND PLAY.          ";
270 PRINT@290,"7. SAVE MUSIC FILE TO TAPE.";
280 PRINT@322,"8. LOAD FILE FROM TAPE.     ";
290 PRINT@354,"9. PRINT MUSIC FILE.        ";
300 PRINT@393,"select"B$"option";
310 PRINT@430,STRING$(3,159);
320 PRINT@462,CHR$(159);B$;CHR$(159);
330 PRINT@494,STRING$(3,159);
340 PRINT@463," ";
350 A$=INKEY$:IF A$=""THEN PRINT@463,B$;:GOTO340 ELSE GOTO370
360 GOTO340
370 IF ASC(A$)<49 OR ASC(A$)>57 THEN 340
380 PRINT@463,A$;
390 FOR WAIT=1 TO 1000:NEXT WAIT
400 ON VAL(A$) GOSUB 430,2140,490,1430,2440,2000,1240,1620,1790
410 GOTO180
420 IF A$=CHR$(13) AND Z=1 THEN RETURN
430 REM create a file
440 IF N=1 THEN RETURN
450 IF N<>1 THEN CLS0:PRINT@10,"are"B$"you"B$"sure?";
460 A$=INKEY$:IF A$=""THEN 460
470 IF A$<>"Y"THEN RETURN
480 RUN
490 REM editor mode
500 IF N=1 THEN RETURN
510 CLS0
520 PRINT@2,"num"B$;B$"note"B$"tem"B$"oct"B$"vol"B$"len"B$"pau";
530 PRINT@482,"aPpend"B$;B$;B$"Delete"B$;B$;B$"Add"B$;B$;B$"Menu";
540 GOSUB 2480
550 C=1
560 PRINT@(C*32)+INC,">";:PRINT@(C*32)+INC,B$;
570 A$=INKEY$:IF A$=""THEN560
580 IF A$=CHR$(95) AND PAGE=1 THEN GOTO 560
590 IF A$=CHR$(91) AND PAGE=183 THEN GOTO560
600 IF A$=CHR$(95) THEN PAGE=PAGE-14:GOSUB 2480:GOTO560
610 IF A$=CHR$(91)THEN PAGE=PAGE+14:GOSUB2480:GOTO560
620 IF (A$=CHR$(94) AND C<>1) THEN C=C-1:GOTO560
630 IF (A$=CHR$(10) AND C<>14) THEN C=C+1:GOTO560
640 IF A$="P"THEN GOSUB 710
650 IF A$="D"THEN GOSUB 950
660 IF A$="A"THEN GOSUB 1040
670 IF (A$="S" AND PAGE+(C-1)<N)THEN GOTO 1160
680 IF (A$="F" AND PAGE+C<=N)THEN GOTO1200
690 IF A$="M"THEN GOTO180
700 GOTO560
710 X=1
720 IF PAGE+C>N THEN RETURN
730 PRINT@(C*32)+PP(X,1),">";:PRINT@(C*32)+PP(X,1)," ";
740 A$=INKEY$:IF A$=""THEN 730
750 IF (A$=CHR$(9) AND X<>6) THEN X=X+1:GOTO730
760 IF (A$=CHR$(8) AND X<>1) THEN X=X-1:GOTO730
770 IF A$="A" THEN GOTO 800
780 IF A$=CHR$(13) THEN GOTO560
790 GOTO730
800 PRINT@(C*32)+PP(X,1),">";
810 G$=""
820 A$=INKEY$:IF A$=""THEN 820
830 IF A$=CHR$(13) THEN GOTO 870
840 IF ASC(A$)<PP(X,2) OR ASC(A$)>PP(X,3) THEN 820
850 G$=G$+A$:PRINTA$;
860 GOTO820
870 IF X=1 AND LEN(G$)>1 THEN GOTO 560
880 IF LEN(G$)>3 THEN GOTO0560
890 IF LEN(G$)<1 THEN GOTO0560
900 IF X=4 AND VAL(G$)>31 THEN GOTO0560
910 IF X=3 AND VAL(G$)>5 THEN GOTO0560
920 IF VAL(G$)>255 OR VAL(G$)<1 THEN PRINT@(C*32)+PP(X,1),
">   ":GOTO800
930 N$(PAGE+(C-1),X)=G$
940 GOSUB2480:GOTO560
950 IF N=1 THEN RETURN
960 FOR I=PAGE+(C-1) TO N
970 FOR Z=1 TO 6
980 N$(I,Z)=N$(I+1,Z)
990 NEXTZ
1000 NEXTI
1010 N=N-1
1020 GOSUB2480
1030 GOTO0560
1040 IF N=197 THEN RETURN
1050 FOR I=N TO PAGE+(C-1) STEP-1
1060 FOR Z=1 TO 6
1070 N$(I+1,Z)=N$(I,Z)
1080 NEXTZ
1090 NEXTI
1100 FOR Z=2 TO 6
1110 N$(PAGE+(C-1),Z)="0":NEXTZ
1120 N$(PAGE+(C-1),1)=""
1130 N=N+1
1140 GOSUB2480
1150 RETURN
1160 REM
1170 SOUND255,1
1180 ST=PAGE+(C-1)
1190 GOTO0560
1200 REM
1210 SOUND255,1
1220 EN=PAGE+(C-1)
1230 GOTO0560
1240 IF N=1 THEN RETURN
1250 CLS0
1260 POKE&HFFD6,0
1270 MOTORON:PRINT@0,"ready"B$"tape"B$"then"B$"press
"B$"enter":
1280 A$=INKEY$:IF A$=""THEN 1280
1290 IF A$<>CHR$(13)THEN 1290
1300 CLS
1310 PRINT@168,"ENTER FILENAME:"
1320 PRINT@200,;:INPUT F$
1330 OPEN"O",£-1,F$
1340 PRINT£-1,N,
1350 FORI=1 TO N
1360 FOR Z=1 TO 6
1370 PRINT£-1,N$(I,Z);
1380 NEXTZ
1390 NEXTI
1400 CLOSE £-1
1410 MOTOROFF
1420 RETURN
1430 IF N=1 THEN RETURN
1440 POKE&HFFD6,0
1450 FOR I=1 TO N-1
1460 T=0:FOR Z=2 TO 6:IF (VAL(N$(I,Z))<=0 OR N$(I,Z)="")
THEN T=T+1:NEXTZ
1470 IF N$(I,1)=""THEN T=T+1
```

Continued

```
1480 IF T>0 THEN RETURN
1490 T=0:FOR Z=1 TO 6:IF N$(I,Z)=""THEN T=T+1:NEXTZ
1500 IF T>0 THEN 1600
1510 PLAY"P"+N$(I,6)
1520 PLAY"L"+N$(I,5)
1530 PLAY"V"+N$(I,4)
1540 PLAY"O"+N$(I,3)
1550 PLAY"T"+N$(I,2)
1560 PLAY N$(I,1)
1570 IF A$="1" AND INKEY$=""THEN 1570
1580 IF INKEY$="A"THEN RETURN
1590 NEXTI
1600 POKE&HFFD7,0
1610 RETURN
1620 CLS0:PRINT@0,"ready"B$"tape"B$"then"B$"press"B$"enter";
1630 POKE&HFFD6,0
1640 MOTORON
1650 IF INKEY$<>CHR$(13)THEN 1650
1660 CLS
1670 PRINT@168,"ENTER FILENAME:"
1680 PRINT@200,;:INPUT F$
1690 OPEN"I",£-1,F$
1700 INPUT£-1,N
1710 FOR I=1 TO N
1720 FOR Z=1 TO 6
1730 INPUT£-1,N$(I,Z)
1740 NEXTZ
1750 NEXTI
1760 CLOSE£-1
1770 MOTOROFF
1780 RETURN
1790 IF N=1 THEN RETURN
1800 CLS0:PRINT@0,"check"B$"printer"B$"then"B$"press
"B$"enter";
1810 IF INKEY$<>CHR$(13)THEN 1810
1820 CLS:PRINT@168,"PRINTING..."
1830 PRINT£-2,CHR$(13);
1840 PRINT£-2,STRING$(52,"-")
1850 PRINT£-2," NUMBER  NOTE  TEMPO  OCTAVE  VOLUME  LENGTH
PAUSE"
1860 PRINT£-2,STRING$(52,"-")
1870 PRINT£-2
1880 DATA 2,10,16,24,32,39,47
1890 DIM PS(7):FOR I=1 TO 7:READ PS(I):NEXTI
1900 FOR I=1 TO N-1
1910 PRINT£-2,;TAB(PS(1));I;
1920 FOR Z=1 TO 6
1930 PRINT£-2,;TAB(PS(Z+1));N$(I,Z);
1940 NEXTZ
1950 PRINT£-2
1960 NEXTI
1970 PRINT£-2:PRINT£-2,STRING$(52,"-")
1980 RETURN
1990 GOTO1990
2000 IF N=1 THEN RETURN
2010 CLS0:PRINT@0,"OPTION 1";
2020 POKE&HFFD6,0
2030 PRINT@32,"computer"B$"waits"B$"after"B$"each"B$"note";
2040 PRINT@96,"OPTION 2";
2050 PRINT@128,"computer"B$"plays"B$"continuously";
2060 PRINT@192,"WHICH OPTION?";
2070 A$=INKEY$:IF A$=""THEN 2070
2080 CLS0
2090 FOR I=1 TO N-1
2100 PRINTB$;B$;"numb"B$"not"B$"tem"B$"oct"B$"vol"B$"len
"B$"pau"B$;B$;
2110 PRINTTAB(1);I;TAB(8);N$(I,1);TAB(11);N$(I,2);TAB(15)
;N$(I,3);TAB(19);N$(I,4);TAB(23);N$(I,5);TAB(27);N$(I,6)
2120 GOTO1490
2130 GOTO2130
2140 IF N=197 THEN RETURN
2150 CLS0
2160 PRINT@482,"num"B$"note"B$"tem"B$"oct"B$"vol"B$"len"B$
"pau"B$;B$;
2170 IF N=197 THEN RETURN
2180 PRINT@481,N;
2190 FOR Z=1 TO 6
2200 PRINT@480+PP(Z,1)-1,">";
2210 G$=""
2220 A$=INKEY$:IF A$=""THEN 2220
2230 IF A$=CHR$(12) THEN RETURN
2240 IF A$=CHR$(13) AND G$=""THEN GOTO 2400
2250 IF A$=CHR$(13) THEN 2300
2260 IF A$=CHR$(8) THEN PRINT@480+PP(Z,1),"   ";:GOTO 2200
2270 IF ASC(A$)<PP(Z,2) OR ASC(A$)>PP(Z,3) THEN 2220
2280 G$=G$+A$:PRINTA$;
2290 GOTO 2220
2300 IF Z=1 AND LEN(G$)>1 THEN PRINT@480+PP
(Z,1),"   ";:GOTO2200
2310 IF Z=4 AND VAL(G$)>31 THEN PRINT@480+PP
(Z,1),"   ";:GOTO 2200
2320 IF Z=3 AND VAL(G$)>5 THEN PRINT@480+PP
(Z,1),"   ";:GOTO2200
2330 IF VAL(G$)>255 OR VAL(G$)<1THEN PRINT@480+PP
(Z,1),"   ";:GOTO2200
2340 N$(N,Z)=G$
2350 PRINT@480+PP(Z,1)-1," ";
2360 NEXT Z
2370 N=N+1
2380 PRINT@511," ";:PRINTB$;B$;
2390 GOTO2160
2400 N$(N,Z)=N$(N-1,Z)
2410 PRINTN$(N,Z);
2420 GOTO2350
2430 GOTO2430
2440 IF ST>EN THEN RETURN
2450 POKE&HFFD6,0
2460 FOR I=ST TO EN
2470 GOTO1490
2480 I=1:FOR P=PAGE TO PAGE+13
2490 PRINT @(32*I)+1,P;TAB(7);N$(P,1);TAB(12);N$(P,2);TAB(16)
;N$(P,3);TAB(20);N$(P,4);TAB(24);N$(P,5);TAB(28);BL$;:PRINT@
(32*I)+28,N$(
P,6);
2500 I=I+1
2510 NEXTP
2520 RETURN
```

Son et Lumière

John Cantrell's assistant at his slide shows is – his Dragon

OVER the years there have been many articles and letters concerning the uses to which the Dragon might be put. The search to find something useful to do with a computer is very real, although one suspects that people who read *Dragon User* are the hardcore of owners for whom the Dragon is more than a games toy.

Many people own cameras and slide projectors, take pictures on their summer holidays and then enjoy reliving pleasant memories when they have returned home.

Obviously part of the enjoyment of a slideshow is the quality of the pictures themselves. It is well outside the scope of this article to offer advice on the actual taking and selection of slides but there are many excellent books on the subject in local libraries.

Another, major, aspect of a slideshow is the presentation and it is in this area that your Dragon can help turn just a collection of pictures into an impressive show.

The first and easiest use to which your Dragon can be put is in designing titles. I imagine that most users will have access to some kind of graphics programme, either bought as a package or typed in from one of the excellent articles that have appeared in *Dragon User*. There are two ways to approach the job of titling.

The first, and more difficult way is to create a 'library' of title screens on cassette tape and have the titles appearing on the TV screen at the appropriate moment. Naturally the projection screen must be placed next to the TV or monitor, and the timings can be difficult. It is, though, a novel way to title your slide show and never fails to impress the viewers! However, as I am going to suggest another use for the cassette later I recommend the second, easier method of titling.

This method helps to give that professional touch by creating your title on the screen and then taking a photograph of it. Because of the nature of the scan on a T.V. set or monitor it is necessary to take the photograph at a speed of 1/15 of a second or slower. The additional need to focus close to the screen means that a single lens reflex camera is by far the best for the job, but such cameras are very common these days and most serious photographers will own one. After processing, title slides can be incorporated in the slide show sequence.

This second method of titling leaves the cassette player available for the important job of music and other sound.

The problem here concerns the type of slide projector which you intend to use. **Listing 1** provides a system for a completely manual projector and works by controlling the cassette motor and prompting you as to when to change slides.

Listing one

0 Sets up title sequence.
1 — 19 These are numbered so that they match the slide numbers in the slide magazine.
20 Displays a red screen to indicate the end of the show.
100 — 115 Sets the time for which the slide will be on screen. The WAIT command is a DragonDOS command where each thousand is equal to 1 second. If you are not using a DOS these lines can easily be replaced by a 'FOR...NEXT' loop to create the correct delay.
125 — 128 This puts a small white square on the top right hand corner of the screen. This square is the prompt which indicates to the operator that a slide is to be changed.
500 — 620 This subroutine switches the cassette on and off at the correct slide. The timings for music are not as difficult as you might expect and can be done with a stopwatch or built in timer routine. A timer routine is shown in **listing 2** and could be incorporated into **listing 1**. The timer routine can then be deleted when the music matches the slides. The slight delay at line 520 is to give time for the cassette motor to reach operating speed.
1000 — 30 Starting sequence
2000 — 30 Computer music can be placed as subroutines and called at any particular point in the show. This example plays *Food, glorious food* when a picture of a barbecue comes up. If you have a copy of *Composer* by Microdeal or similar utility you can call up quite sophisticated tunes from within the program itself.

This system works very well and you can get good results. There are one or two drawbacks. The operator cannot really watch the slides because he is watching for the white dot to appear. Also, if he misses a dot, the whole sequence is thrown out.

The solution to these problems is to have a fully automated show where the computer changes the slides. This is only possible if you own an automatic projector. There are two main types: (a) where the button which changes the slide is connected to the projector by a wire or (b) where the button which changes the slide activates an infra-red beam which is picked up by the projector, that is, a cordless system. Both types are quite common.

Whichever type you have you will find that the switch which activates the slide change is basically very simple.

Let me make it quite clear that I am the sort of person who can have trouble changing a lightbulb — but this wiring modification is really very easy — just open up the projector's controller, find the switch which changes the slide and connect the Dragon tape lead as shown in **figure 1**.

To achieve computer control of the projector you simply wire the cassette motor lead to either side of the switch. On my lead the connections are as shown in **figure 2**.

If you have the infra-red type of projector you can now change slides with the projector on the opposite side of the room from the computer. If you have the wired type then obviously the projector will have to be fairly close to the computer.

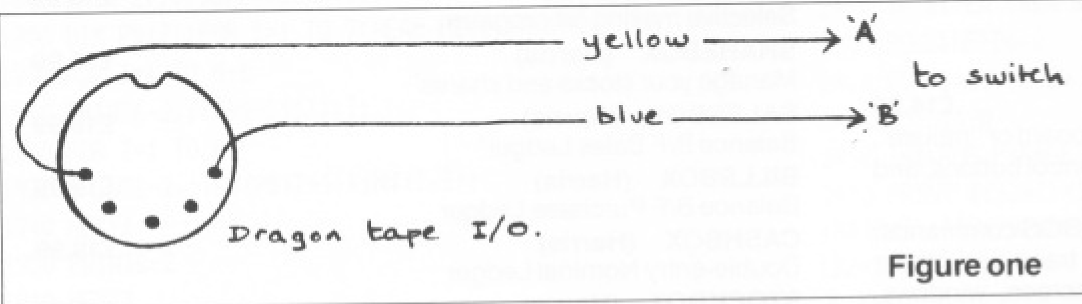


Figure one

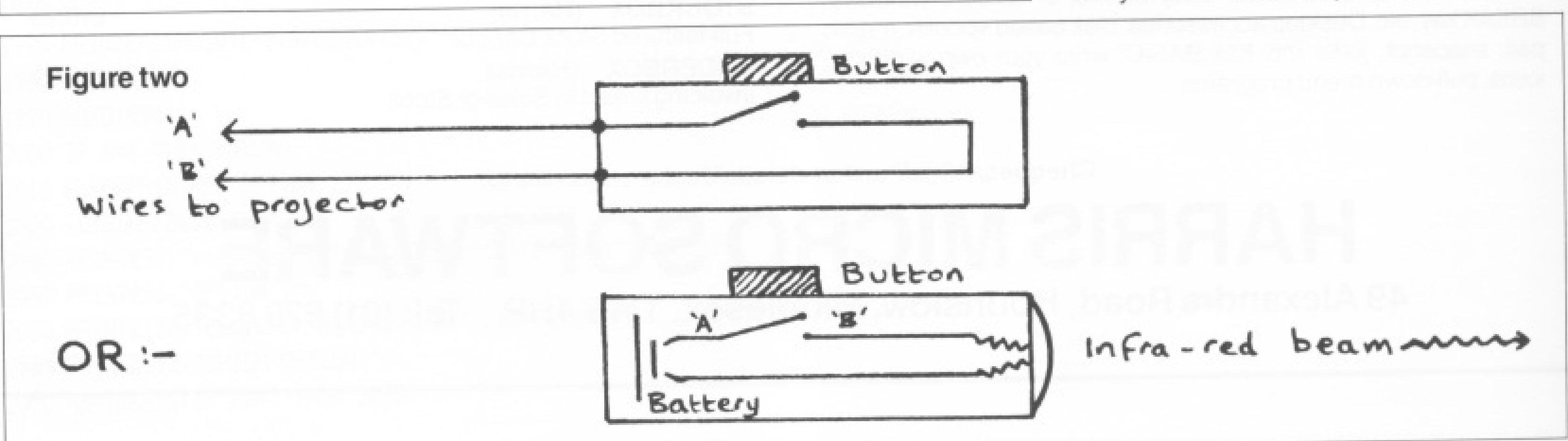


Figure two

Listing one

```
0 GOSUB1000:CLS0
1 GOSUB 500:GOSUB 110
2 GOSUB 105
3 GOSUB 103
4 GOSUB 108
5 GOSUB 105
6 GOSUB 115
7 GOSUB 102
8 GOSUB 108
9 GOSUB 106
10 GOSUB 600:GOSUB 105
11 GOSUB 106
12 GOSUB 102:GOSUB 2000
13 GOSUB 103
14 GOSUB 500:GOSUB 108
15 GOSUB 105
16 GOSUB 103
17 GOSUB 103
18 GOSUB 600:GOSUB 110
19 GOSUB 115
20 CLS4:GOTO20
100 REM*******TIME DELAY*********
102 WAIT 2000:GOTO125
103 WAIT 3000:GOTO125
105 WAIT 5000:GOTO125
106 WAIT 6000:GOTO125
108 WAIT 8000:GOTO125
110 WAIT 10000:GOTO125
112 WAIT 12000:GOTO125
115 WAIT 15000:GOTO125
125 SET(63,0,5)
126 WAIT 1500
127 CLS0
128 RETURN
500 REM*****CASSETTE SWITCH*****
510 MOTOR ON
520 WAIT 100
530 AUDIO ON
540 RETURN
600 AUDIO OFF
610 MOTOR OFF
620 RETURN
1000 CLS0:PRINT@130,"SET TAPE TO CORRECT POSITION"
1010 PRINT@162,"SET PROJECTOR TO FIRST SLIDE"
1015 MOTOROFF
1020 PRINT@226,"PRESS SPACEBAR WHEN READY"
1030 Q$=INKEY$:IF Q$=" " THEN RETURN ELSE GOTO 1030
2000 REM*******TUNES************
2010 A$="O4L3CO3L6GL7EO3CL2B-L4AL7FDO2BO3L6G+L3G"
2020 B$=A$+A$:PLAY"V02T3"+B$
2030 RETURN
```

Listing two

Listing 2 shows how the slide delays are set up. This is a much neater arrangement than for the manual projector, and means the length of time any particular slide is on show is easily changed by altering the appropriate DATA line.

5 Prevents premature firing of the slide mechanism.

10 — 40 Start sequence.

45 — 48 Music Cue. Because the computer now controls the projector and not the cassette, these lines flash a white screen which prompts you to switch on the tape recorder.

50 — 65 Data lines. The time in seconds for each slide. You add as many as you need. The total number of data statements must match the number of slides specified in line 110.

100 — 150 Main loop which reads the data and 'fires' the projector. Line 110 is the total number of slides (see above).

Lines 100 and 200 can be used to time all or part of the show so that the commentary and/or music can be be put on tape accurately. To use these lines just remove the REM statement. **Listing 2** can also incorporate computer music if you wish by splitting the reading of the data into two or more batches and using a subroutine for the PLAY command as in **listing 1**.

You should now be in a position to create a slideshow which is out of the ordinary and will entertain other people as well as providing you with memories of your holidays. For those who wish to go further it might be possible to control both the projector and the cassette by use of relays or by using the cassette port and one of the joystick ports together. Good viewing!

Listing two

```
5 MOTOROFF
10 CLS0:PRINT@130,"SET TAPE TO CORRECT POSITION"
20 PRINT@162,"SET PROJECTOR TO FIRST SLIDE"
30 PRINT@226,"PRESS SPACEBAR WHEN READY"
40 Q$=INKEY$:IF Q$=" " THEN 45 ELSE 40
45 CLS0
49 REM *****TIME DELAY*******
50 DATA 1000,9000,1000,2000,5000
55 DATA 5000,3000,4000,5500,2750
60 DATA 2000,4500,6000,9000,8000
65 DATA 4000,3000,2500,7000,9999
99 REM *****PROJECTOR SWITCH*****
100 REM TIMER=0
110 FOR SLIDES=1 TO 20
115 READ P
118 WAIT P
120 MOTORON
130 MOTOROFF
150 NEXT SLIDES
200 REM T=TIMER:E=T/50:PRINT"TIME ELAPSED="E "SECONDS":STOP
500 CLS4:GOTO500
```

Write: ADVENTURE

A dead Dragon gives **Pete Gerrard** *some new ideas.*

OWING to a minor technical hitch (see *Adventure Trail* for full explanation) we won't be doing any programming this month. On the other hand, this does give me the opportunity to answer a query common to a lot of your letters, and that is; "I'd like to write an adventure but everything's been done alrady. Where do I start?"

Everything has *not* been done already, is the first point to note. People have been writing books for a lot longer than they've been writing adventures, and still they manage to come up with fresh ideas. It is true that quite a large number of themes have been done so many times that there's little point in considering them further. I'm talking here about things like spoof versions of *Colossal Cave*, or plundering ideas from *Lord of the Rings*.

I'll even admit to using a dwarf and a wizard in my last completed adventure, something that started off life as a very small game just to show a friend how rapidly you can complete an adventure once you've got all the main routines sorted out and working from other games. Like so many things, the adventure grew, and the legend of Dimli Gloing the Wonder Dwarf is now rather more of the finished item.

I've already started work on a follow-up to that one, but meanwhile there are so many other ideas floating about that there are times when I feel that I'll never have enough hours in the day to consider using them all. All these ideas really started taking off when I 'discovered' two other adventure fanatics in my locality, and we now quite regularly meet up and talk about the genre (among other more mundane matters like beer and pool!). From these discussions spring many a thought for a game, and I cannot emphasise enough how useful and important it is to get in touch with fellow (are females fellow?!) (*It doesn't matter what colour they are — Ed.*) adventurers. Apart from generating ideas it helps to have someone around who can test a game for you.

One of the more ususual themes suggested from these meetings is that of considering the game from a different standpoint from the usual 'You are a gaunt adventurer in search of treasure" or 'You are a detective' or 'You are a space pilot', or whatever. In other words, you do not necessarily have to be a human being.

For example, many of you I'm sure will have read the wonderbook *The Colour of Magick* by Terry Pratchett. This has been turned into an adventure game (alas, not for the Dragon), and in it you play the part of a tourist trapped in a strange part of an even stranger world. With you is a magical piece of animated, thinking luggage with hundreds of legs, and someone suggested that the game would have been much better if you played the part of the luggage and everything was taken from there.

Other ideas (which will never be used by us, so feel free, anybody) touched on the cartoon characters Garfield and Snoopy. Ignoring copyright just for the moment, wouldn't it be a wonderful change if you played either Garfield or Snoopy in an adventure, rather than the human beings who also opoulate the cartoon strips? Leading on from that, there is nothing to stop you producing an adventure where the hero, the person playing the game, is a cat or dog. Apart from anything else, it gives you the opportunity to produce problems that would be different from the sort of thing that we are more used to encountering in adventures. Things could be viewed from cat or dog level, rather than human or wizard level.

((You are Goldie the Cat. It is 7.35am. The fridge is tightly shut. Mistress is in bed, snoring. Only mistress can open the fridge. Mistress's throwing copy of The Dune Hardback Omnibus lies where it landed yesterday, out of reach. Cautiously you advance, one razor-sharp claw extended...))

That is just one different train of thought. Another series of adventures, which again we'll probabaly never get round to using, so get programming, came about the night before writing this article. By the merest chance, two of us had met up in a pub during the evening. Oh, all right, we'd been playing adventures all afternoon and went to the pub to recover. Anyway, while there we met one of the local characters, a lad called Archie. Things happen to Archie. He's one of life's disasters, waiting to happen. He falls over walls, into hedges, and generally speaking if there's anything inanimate lying around Archie will sooner or later suffer at the hands of it. Wouldn't it be an interesting and unusual adventure if you were to play the part of his guardian angel and your task was to guide him thorugh 24 hours without any mishaps befalling him? You could go north, south, east or west as usual, but Archie could (say) go to the pub, go home, go to town, or go away from town, and more often than not would not go in the direction you wanted him to move in. Naturally, you would have to compensate by allowing the guardian angel to go twice as fast.

From this all you have to do is look around at some of the people you know, and ideas, different ideas, for games begin to present themselves. Rather like Douglas Adams and his Infocom game *Bureaucracy*, take a real life situation and think of it in terms of an adventure. It makes a change from re-reading the *Foundation Trilogy* to get ideas to rehash.

Having written the adventure you'll then want to test it was well, and this brings us back to the point mentioned earlier, namely having fellow adventurers around or contactable by post who can test the game for you. This is turn will put you in the position of testing adventures for other people, so what is the game player looking for when he gets his (or her, of course) game tested? Well, let's take a real situation and see what happened.

Without giving away anything about the game, a freind of mine had written an adventure that she wanted testing, and I said that I'd be happy to oblige. Anything for a drink! As well as playing and writing adventures I have the good fortune to occasionally review then as well, and combining everything gives me a reasonable clue as to what people like and dislike about the games, although I know I'll never agree wholeheartedly with anyone who thinks an adventure isn't an adventure unless it has reams of graphic screens popping up all over the place.

The first thing to think about is that in the long run it's going to be kinder to be cruel. The person who's written the game might be your best friend, but they're not going to thank you if you try and tactfully ignore something and later a magazine reviewer with a vast audience picks on that very thing and gives the game 1 out of 10 because of it. If you see something wrong, point it out!

I start by playing the game as if I'd just rushed home from the shops, tore it out of its cellophane wrapping and loaded it into the machine. Like any other adventure, I'll begin drawing a map (always at the wrong place on the sheet of paper, naturally), noting objects found, problems encountered, and any exits that I can come back to and explore later. But then, the testing side takes over.

You have got to try doing everything to everything to see what happens. Things that you'd never dream of doing in a finished adventure must be tgried and any strange results noted. Since no game is ever really complete and 100 percent free from bugs we must expect mistakes, but better to find them now while they can still be corrected!

Always play the game with a dictionary to hand as well. Spelling mistakes are the bane of the adventure reviewer's life, since so many games seem incapable of having even the simplest word spelt correctly. Some are even incapable of getting the author's name right on the opening screen, but I won't embarrass then by naming them (I'd have to tell you to read another magazine, and She Who Must Be Obeyed wouldn't like that). (*How do you know, Slave? She might be writing it...*) If you find a spelling mistake, note it down and get the author to write it out 200 times.

Are the problems that you encounter logical, or do they rely on a very obscure word, or combination of words, to be solved? If you want to wedge a grate open with a stick, the program should accept anything from *wedge grate with stick* to

prop the gate open using the stick or *push the stick under the grate*. And then check to see if you meant *gate*. So many adventures fall down on their use of words, and to pick one at random I can think of few people who would immediately think of the word 'vascillate' rather than the word 'wait'.

Another thing that I personally dislike is encountering an 'instant death' situation. I don't think that you should ever be killed in an adventure without being reincarnated at least once, and I also don't think that you should be killed off without severe warnings being given, or hints like "If you don't eat something soon you're going to die or starvation". All too often in games I've been killed for no apparent reason, and that should never happen.

The game MUST have a save and restore/load option built into it, preferably a ram save as well, although I'm prepared to live without that. If you're using disc, then give the player the chance to name the file, and have several different save positions available: five is usually sufficient.

Finally, does the game as a whole stand up? That is, does it make a coherent story from start to finish and provide me, the player, with an interesting and thought provoking set of challenges that are different from anything that I've seen before? Some familarity I'm prepared to accept, and indeed welcome on some occasions, giving newcomers the chance to feel their way gently into the great world of adventures, but if I see another version of *Colossal Cave* it's going to get no marks out of ten no matter how superbly programmed it is!



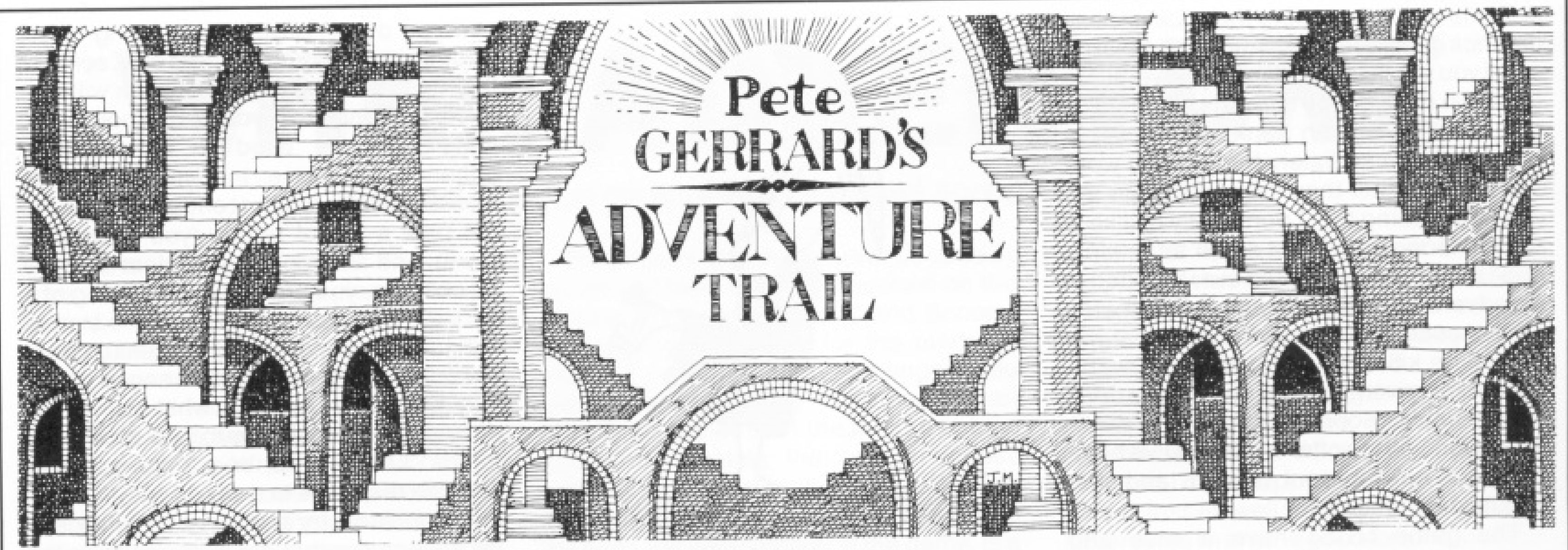
But don't think that this is the end of all your hard work. You'll probably end up seeing the game two, three or even more times before the author feels confident enough to launch it on an unsuspecting public. And quite right too. There are far too many incompetent games being released, and if the situation were reversed and someone was testing one of your games you'd want it thoroughly examined as well.

No game should be released without someone else playing it through first. Different people have different ideas about different things, and what might seen an easy and logical problem to you might perhaps defeat anyone else trying to get through it. Apart from anyting else, some of the ideas that you might get back will probably be things that you never thought of, and could be used to considerably enhance the game. In *Dimli Gloing the Wonder Dwarf* you are at one point forced to get past a set of triffids (you suspect a plant), and although the problem is a wee bit obscure, you are given something of a strong hin and are also told at the start of the game that a love of puns is essential to the solving of it. It all makes sence of you play the game! Anyway, what I hever expected anyone to do was to try and 'kiss the triffids'. Lovely idea, and there is now a suitable response to that.

To conclude, try and come up with ideas for adventures that are different from the norm, and that invoke a sense of surprise in the person playing the game. There's nothing worse than starting a new game and getting that 'here we go again' feeling! Ideas abound, it's up to you to write the adventure.

And if you're testing a game for someone, be ruthless. You can always buy them a drink or something afterwards and restore the friendship. They'll appreciate it in the long run. Finally, if you're writing a game, get it tested and be prepared to hang your head in shame when all the errors are reported. Don't worry, it's far better for one person to write them down than it is for several reviewers to shout them out!

Cheerio.



A gnashing of teeth and lamentations across Wigan. My Dragon's dead! Well, it's undergoing major surgery anyway, and hence it's a mite tricky revewing adventures this month. Those tapes just won't fit into an Amstrad disc drive ... The scene in the shop: "Can you fix this?" I ask, presenting spotty assistant with Dragon that might well have been shot by Bard the Bowman for all I know about it. "No problem, sir," came the stout reply. Realising he was talking to me (sir?!) I left the shop. One week turned into two and I went back. "Fixed the Dragon yet?" "No problem there, sir, all you need is a ..."' and here he named a totally incomprehensible component number at me. "Have you got one?" I asked breezily. "No" was his unhelpful reply. I am still waiting.

However, absence of a Dragon does not prevent me from completing the saga of the missing cassette inlay notes from *El Diablero*, and carrying on from where we finished last month, we have the following:

'Listed below are some special features of El Diablero.

'Enhanced movement.

'Outdoor locations are large and have arbitrary perimeters that cannot be crossed. To avoid the drudgery of repeatedly typing GO EAST, GO EAST etc., you can use the arrow keys to control movement instead. The up and down keys are for going north and south, the right arrow is for GO EAST, the @ key is used for GO WEST (this leaves the left arrow for backspacing).

'Danger situations

'When a location description is preceeded with the words I AM IN DANGER!, there is only one correct response which will keep you from being killed. There are no second chances. However, there are subtle warnings which will keep you from getting into the situation before you are prepared.

'Some hints

'It's a good idea to examine unusual things well. They will often give useful hints. You can only carry a limited number of items with you. To see a list of what you're carrying type INVENTORY. Should you want to save a game to be continued later, the CSAVE command will save the game status to tape. The CLOAD command can be used to reload the game. The disc version uses DLOAD and DSAVE. These commands can be used freely, except in danger situations as noted above."

End of cassette inlay notes and back to me again. Now that you know what you're doing, perhaps a few of you can get further in this interesting Dragon adventure.

To the rescue

Apologies to Peter Hawes for missing him out last month. A long and interesting letter, bits of which we'll be coming to in a moment, and he says that if anyone wants any help with *Trekboer*, *Syzygy*, *Jerusalem Adventure*, *Sunken City*, *Sea Quest*, *Shenanigans*, early stages of *Juxtaposition* and *Return of the Ring*, *Colossal Caves*, *Vortex Factor* and/or *Ring of Darkness* (he's 16, young Peter, and if he's got through this lot, what will he have solved by the time he reaches my exalted years?!) then send an SAE to Peter at 9 Strangford Road, Whitstable, Kent CT5 2EP and you will receive your help.

Anyway, back to his letter (another grovelly one, love it), and hints for no less than eight different adventures. What a busy chap.

Shenanigans first of all. If you want to find the four leaf clover, then namow lufituaeb a rednu kool in a meadow of clover near the river. There are times when brother Mike's use of backward writing to disguise clues is a point in the *****!

Vortex Factor next. When in the London scene you get thrown into the dungeon, you'll need the saw to srab was. Don't forget the examine the skeleton more than once. Also, revel llup in the sarcophagus to retrieve the lost treasure. All treasures must be placed in the small room at the top. If you're stuck on the scene with the humanoid then try hciwdnas eht ti gnideef because it's very hungry. Also, if you're having trouble with the coal (and I refuse to type all this lot out backwards) then try going srary wef a kcab to insert it in the rebmahc desirusserp, pressing the button, and lo and behold when you return tneserp eht ot, before you know it you have a diamond in the chamber. Well, fancy that.

On to *Sea Quest*. You have to use the metal detector more than once. To find a passage you must llafretaw og and then to find yourself outside the house you must eloh og and only by wodniw kaerb can you enter and find its treasures. To raise the anchor on the bottom you have to (curses!) droc llup neht rohcna ot noollab rehtaew eit.

Return of the Ring comes under the hammer now, with the following snippets of information. To escape the nightfall mutant you must ridehs esu and to get the book of skulls you have to koob ekar pord when you are in the nightfall mutant's cave, and then slluks fo koob teg. You have to remember to get out of the place fast before day turns into night, otherwise you're going to be in a spot of bother! You need full experience and many credits (it says here). Your companions Sidevalve, Merak the Elf and Sidone the technician will all be helpful by carrying itiems for you such as weapons, rings and energy packs 1,2,3 and 4 even. Try to avoid the sapper on levels nine and ten (goes without saying, really).

Juxtaposition (is there an adventure he hasn't played?) gives us the next lot of clues, starting with escaping from the Green Tower with the Eridani Emerald in it. You need to use a sender unit, which can be found next to the Deeds of Brown on the other side of the river down a shack in the Blue Lands. If you're stuck on the top balcony, try rehtegot steknalb gnieit, and climbing down then on to a lower balcony. When the droid has been killed you'll have to examine it to find an important pass.

Shenanigans again. The landlord wants yemon emos. To wander along the streets bup eht ni reeb a knird. To get rid of the muggers, you must efink wohs to them. To get any further in the adventure you need to find a gold underground ticket and enter the gates with it.

Sabres and spiders

But enough of *Shenanigans* and on to *Syzygy*. To enter the airless corridor, htaerb dloh, and to ge trid of the alien creature yzzuf worht. Then, hctiws sserp to light up the room and get the light sabre in the end room. However, in the other dark room you need the light sabre to fight Darth Vader. To kill him you need to keep your sabre crossed with his all the time so as to outmanoeuvre him.

Ever onwards and we arrive at *Trekboer*, and I'm blowed if I'm writing this lot backwards either. To get out of the matrix you need to redips eht ot eluspac eht evig, which will knock it out, then take redips eht

to the pressurised room where you need to drop it. Press the button again and deraep-pasid evah lliw redips eht. Then you can pull the grate and go to the grate (or vent). There is redips eno ylno, the same one, says Peter. A remarkable knowledge of arachnid anatomy.

To get back out of the chasm you needed (ahah!) to have tied the rope to a tree before you crossed the bridge, then you can climb rope when in chasm. They (this is me) always seem to be described as yawning chasms, but they never fall asleep. (*Unlike the typist. Have you any idea what copy-typing backwards does to your sense of direction gninrom eht ni gniht tsrif?*)

Finally, we get to that legend amongst adventure games, *Total Eclipse*. To be able to get the hyperdrive unit you have to trade to get 100,000 credits. To do this setarip nwod toohs to gain gems and narcotics to boost your income. Peter says that he found that when you have the narcotics on you it's best to say NO to the customs officials, but if you're only carrying gems and luxuries then it's best to say YES to them, to avoid having them taken away.

Attention authors

End of saga, and thank heavens for people like Peter Hawes when your Dragon's being treated by what could well be Doctor Bob from the Muppet Shown from all the results I've seen so far. (*You should have called Harry, Pete!*)

Always ready to help a cause, and John Foster, at 94 The Oval, Firth Park, Sheffield S5 6SP, seems a worthy enough one to me. He's taking the brave step of setting up a software house, called (if I can read his writing properly, obviously training to be a doctor writing out prescriptions) Chera Design. An anagram of chasing deer, but there must be more to it than that! Anyway, John is looking for new games to sell, and is willing to look at any adventures that you lot out there have written together with a FULL solution (no hints only, he wants the whole thing) then your game will be evaluated and, if considered good enough, taken on board and put into production. He's not only looking for ordinary (ha!) text adventures, but graphics ones and arcade games (spit) as well. So hop to it, ever patient reader, and see your name in lights. (*You won't post anything anywhere without keeping a copy, will you? — Ed.*)

More hints

On to another old friend of *Adventure Trail*, namely Andrew McBride at 109 Main Street, Lt. Harrowden, Nr. Weillingborough, Northants NN9 5BA. Andrew offers the usual help service, having completed the following (deep breath): *Juxtaposition, Return of the Ring, Ring of Drakness, Mansion, Jerusalem, Williamsburg, Ulitmate* speling went a bit awry there, Andrew!, *Vortex Factor, Aquanaut 471, Calixto Island, Quest, Castle Adventure, El Diablero, Wings of War, Cricklewood Inncident, Mountains of Ket, Temple of Vran*.

Despite all that lot, he's a sucker for punishment and is desperately trying to lay his hands on a copy of *Total Eclipse*. If anyone out there has a copy then don't want, and they're willing to sell it complete with instructions, get in touch with Andrew and start haggling over the price.

In return for this, we have some hints on *The Final Mission*. And I quote...

To get past the second door, type 'remove panel' in the east end of the panelled corridoor to find a key. Once past the monk you come to the five guardians, all of whom ask you questions and everyone has an answer apart from guardian number two. Here are the answers:

Guardian 1 — say "26,9"
Guardian 2 — nowt!
Guardian 3 — say "Anagram"
Guardian 4 — say "Ga"
Guardian 5 — say "TLE"

First say the answer to the fourth and third, then go through the archway of the third, get pendant (where it says something about a low tunnel), go west, which will take you into a room which is not meant to be known, go north and you come out of the fourth archway.

Looks at top of computer screen, sees word processor metaphorically screaming "STOP!" at me, so I will. See you next month.

Dragon Answers

If you've got a technical question write to Brian Cadge. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

Slightly off colour

SOME time ago I purchased a second-hand Dragon 32 plus some games. On testing it from 'search' I don't seem to get all the screen colours. Colour 5 gives a grey/silver colour (rather than buff), blue gives dark blue, red gives plum and so on. I have tried this on two TVs. Is there a minor fault in the Dragon 32 colour circuits?

Alan Lott
6 Richmond Road
Reading
Berks

UNFORTUNATELY, the Dragon 32's colour display was never exactly 'spot on' even with a composite monitor. The circuit has been cleaned up in the Dragon 64 which gives a much better colour display (still not perfect though). I did know of a company who would change a few transistors etc. in your 32 to improve the display quality, but alas they are no more. Unless any reader knows of a similar service in action I'm afraid you'll just have to live with the off-shade colours on your 32!

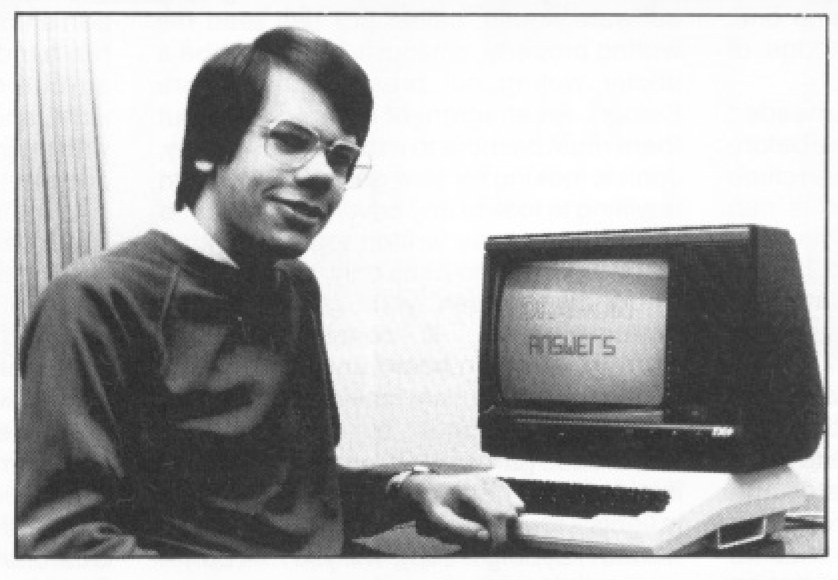
Point floats away

I am writing to ask for your help with regard to retrieving simple and array variables from memory. String variables don't seem to be any problem, but my trouble is with the FAC (floating point accumulator).

The program I'm trying to write is a spreadsheet where values in a matrix are printed on the screen. I'm wishing to use M/C code to output variables to screen rather than a Basic FOR/NEXT loop. The M/C code and basic programs I am using are:

Machine Code:

```
ORG $3D00
JSR $8B2D
TFR D,X
JSR $D3BF
LDX #$4F
JSR $8B2D
JSR $8C37
RTS
END
```



Basic:

```
10 DEF USR0=&H3D00
20 A=40
30 B=VARPTR(A)
40 C=USR0(B)
50 PRINT C
```

The value of C should be the same as A. Please could you tell me if the routines are correct?

Paul Sweet
Ye Horshoe Inn
Egton
Nr. Whitby
N. Yorks.

YOUR machine code routine calls a number of well known firmware routines. The one at $8B2D will return the value passed as argument to the USR routine as an integer in the 'D' register (ie the value of B in the Basic code). Unfortunately, the routine at $D3BF does not exist (or rather it's within the cartridge area). It is not a valid DOS routine. Finally, the routine $8C37 will return the value in the D register as the result of the USR call.

You don't say where you obtained this particular routine, but as it stands it is not correct. If you wish to process an integer and then return one, only the first and last routine need be used.

Incidently, using machine code ROM routines to print arrays will not noticeably increase the speed of your program anyway!

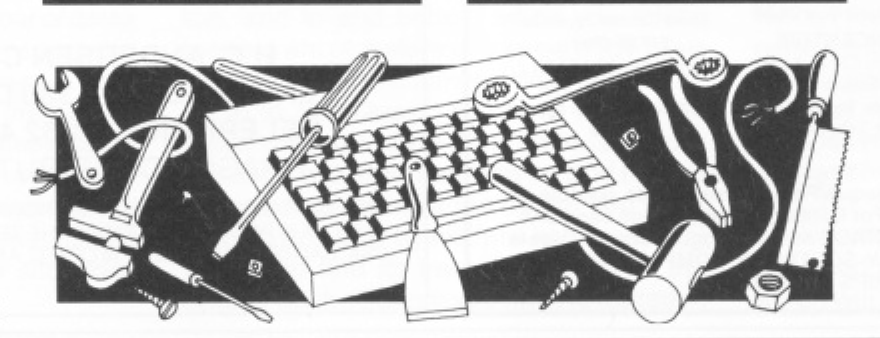
Can the Dragon speak Tandy?

I have just acquired a Tandy Speech Sound Cartridge for use with the Tandy COCO. I have a Dragon 32 and 64 and have tried the cartridge in the ROM port for a physical fit and there is no problem. The cartridge has not been used with the power on. Could you tell me whether this cartridge can be used with the Dragon?

Brian Richardson
1 Oates Close
Shortlands
Bromley
Kent

I am reliably informed that the Speech Sound Cartridge is entirely hardware compatible with the Dragon (although I haven't witnessed one being used with a Dragon). Therefore, there should be no risk of harming your computer with the power on.

However, I'm told that it is unlikely that the software is 100% compatible with the Dragon. If you have the technical information on the sound chips used than it's possible that you may be able to drive the unit yourself.



Tandy routines

COULD you please tell me the Dragon equivalents of the following Tandy ROM routines:

$A59A, $B26A, $B73D, $B26D, $B267

Martin Evans
11 Teglan Park
Tycroes
Ammanford
Dyfed

I assume that you are trying to convert a CoCo machine code program for your Dragon. If so, you are in luck, as all of the above routines have direct equivalents in the Dragon's ROM. They are as follows (together with the firmware name of the routine):

Tandy	Dragon	Firmware Name
$A59A	47052	CopyXU4B
$B26A	35239	CKopbrak
$B73D	36483	Getl6Bit
$B26D	35242	CKcomma
$B267	35236	CKclbrak

Over to disc

I have recently acquired twin DragonDOS drives and have been steadily transferring much of my cassette based programs and data to disc. But I have a real problem with any machine code programs when I haven't listed the start, end and exec addresses. Is it possible once the program has loaded from tape to locate this information so as to be able to transfer to disc?

A.R. Lloyd
121 Glebe Road
Deanshanger
Milton Keynes

THIS is a very common question from new disc drive owners, together with "How can I stop autorun programs from running?". Fortunately, there is a very simple answer to the former (but not to the latter!). Load in your machine code from tape and then print the following PEEKs:

```
START ADRS:
  PEEK(487)*256+PEEK(488)
END ADRS:
  PEEK(126)*256+PEEK(127)-1
EXEC ADRS:
  PEEK(485)*256+PEEK(486)
```

Winners and Losers

Every month Gordon Lee will look at some prize programming

WHEREAS normally the competition provides the prizes, in this case of the July issue, it was the prizes which provided the competition! This Gilbertian situation came about as the prizes were copies of John Penn's *Music Maker* package, and the problem was based on the words MUSIC MAKER.

The puzzle was to assign the digits 1 to 9 to the letters in these words, each different letter representing a different digit, such that the numbers formed by 'MUSIC' and 'MAKER' were both perfect squares. To prevent ambiguity, 'MAKER' should be higher than 'MUSIC'. The quest was to find the different ways this could be done.

Almost all entrants adopted the most logical approach: 1) generate all five-digit squares 2) reject those containing a zero or any duplicated digits and 3) from those which remain, find pairs which: a) commence with the same digit, and b) have all other digits different.

This formed the basis of the program listing given on October's answer page. As regards the entries submitted, the task posed few problems, with the majority of competitors coming up with the correct answers — mainly using the method outlined above. The most common error was in giving only one of the two possible answers — usually due, not to any major error in programming, but simply by the program stopping after the first of the results was printed out.

The fact that most of the entries were correct came as no surprise. Over the past three and a half years that the competition has been running, the ratio of correct to incorrect entries depends generally, not on the relative difficulty of the problem — though this does affect the total number of entries submitted — but into which of two categories the competition problem falls. These are those in which the answer is easily checkable, as opposed to those in which this is not the case.

A good example of the first of these types was the March 1987 problem which featured a small 'cross-number'. Once a possible solution to this has been unearthed by the computer it is a simple task using pencil and paper to determine that it does fit into the grid, and is therefore correct. For this type of problem we would expect, and indeed did receive, an almost all correct set of replies. This is presumably because any obviously incorrect answers were easily detected, and were therefore not submitted. Last month on this page I gave a listing which we received and which claimed a maximum score for the June competition of a sequence of 16 numbers. As the answer that I had been expecting was only eight, this came as a surprise! In fact, the impossibility of this solution would have become readily apparent if each of the numbers in the chain had been printed out, the first five numbers being:

5730
7301
3018
0189
1892 . . . and so on.

A simple test would have shown that none of the above values is a multiple of seventeen, and this would have indicated a fault in the system. In fact, where the program goes wrong is to append the remainder found after the division, instead of finding the four-digit multiple itself.

The second of the two categories is the one in which the answer is not so easily checkable, and it is into this area that the majority of the competitions fall. Here the ratio of correct to incorrect replies is much more variable, and it is on these *Winners & Losers* is based.

Perhaps mention ought to be made here of a special type of competition from this latter category. This is the one in which there is not an absolutely correct answer, merely the best submitted. The competition in January to design an on-screen pattern was one such example, as was the 'primesearch' grid from last February. Incidentally, no-one has so far succeeded in beating the grid of 170 prime numbers which I gave in July's *Winners & Losers* page.

Finally, mention ought to be made of the tie-breakers. They were, almost without exception, so awful that I'm not even going to try sorting out the best! I can only sympathise with one of our Danish readers who is completely bemused by this highlight of the English language. So, to Olav Neilsen of Brabrand, my apologies, and the assurance that such a fearsome tie-breaker will not occur again (well, not too often, anyway!).

CLASSIFIED ADS

DRAGON 32. Books, mags, tapes, dust cover, joysticks, etc. £50 ono. J.D. Law-Green, 1 Whitelands, Rawdon, Leeds, W. Yorks. LS19 6BU Tel: (0532) 503801.

DRAGON 32. £60. Various books, programs, Dragon Users. R.L. Ruxton, 17 Arran Crescent, Beith, Ayrshire. Tel: Beith (05055) 2898.

WANTED for cash. Petite Pascal by Oasis. M.A. Evans, 57 Caishowe Road, Borehamwood, Herts.. Tel: 01-953 1537.

DRAGON 32. Ikon drive, joysticks, masses of programs, all *Dragon Users*, £150 ono. P.M. Jones, 17 Maidstone Drive, Wordsley, Stourbridge, W. Mids. Tel: (0384) 270985.

AAAArrghh, help! WANTED: proficient M/C programmer to write program for personal use. If you are good enough, please contact me as soon as possible. GOOD PRICE PAID!!! Send SAE for details. Andrew Powell, 59 Norfolk Street, Cambridge.

SUPERB WPS. 64 chars. per line display, WYSIWYG, repeat, wrap, bell, insert, delete, centre, blocks, window, etc. 20 redefinable printer functions. Fast m/c routines. Dragondos or casette. £18. R.F. Sibthorpe, High Green, The Drive, Belmont, Surrey SM2 7DH. Tel: 01-643 8804.

DRAGON 32. Perfect. Tape recorder, books, joystick, many tapes (games and tutors), B&W TV. Complete kit: £110 ono. G.D. Davies, 72 Aldenham Road, Bushey, Watford, Herts. WD2 2ND. Tel: Watford 227154.

DRAGON 64. Hardly used. Disk controller, OS-9 operating system with Stylographic word processor and RMS record management system, plus other business software, aslo Dragon books: £140 ono. R.F. Head, 52 Barnet Way, Mill Hill NW7. Tel: 01-906 0684.

DRAGON SOFTWARE for sale. Cassettes and cartridges, all originals, cheap prices. Also back issues of *Dragon User* from '83 onwards. Phone Mathew Lodge on 0606 7273 or send SAE to Maen Melin, Holmes Chapel Road, Lach Dennis, Northwich, Cheshire CW9 7XZ.

DISC SYSTEMS, DRAGON DOS, SCOOTDOS, and **DELTA.** All available. Cartridge with manual; only £55. Also drives and printers. Send wide SAE (or 2 13p stamps), to PRO-TECH SYSTEMS (GB), 25 Pelican Road, Pamber Heath, Basingstoke RG26 6EN.

HERE'S MY CLASSIFIED AD.
(please write your copy in capitals on the lines below)

Name . . . .

Address . . . .

. . . . **Tel:** . . . .

Please cut out and send this form to: Classified Department, Dragon User, 12–13 Little Newport St, London WC2H 7PP.

Make your own maze

Gordon Lee gets competitive with cuboids

LAST month we examined the 'hand on wall' method for threading a maze — 'threading' being the name given for finding one's route around. This technique worked fine for any 'simply' connected maze such as that in diagram 'A' in the November issue. However, with any 'multiply' connected maze (diagram 'B') you will find that although the 'hand on wall' method will bring you out of the maze, there are a number of passages which are not traversed. Clearly, in a more extensive maze this couldf represent a major portion of the maze — and indeed, there could be several of these separate areas, or 'islands', in a larger maze. The more islands that there are, the more difficult the maze would be to follow. One method of threading a route through such a maze dates from the 19th century, where it was first described by a M.Tremaux. It depends on being able to leave markers at certain junctions within the maze to denote that these have already been visited. The method is as follows:

1) No path may be traversed more than twice.
2) When you come to a junction for the first time, choose any path you like (and leave a marker).
3) When, by travelling a path for the first time you reach an already visited junction (or a dead end) return by this same path.
4) When, by travelling on a path for the second time, you reach an already visited junction, take any new path if there is one, otherwise any path (but subject to rule 1).

Listing

```
 10 DIM M(29,29),L$(10)
 20 A$="UCREPGFBFIEBEKJMCBCOBBBQDSBLDADAFAAEAIABCLAGALACBOADCMBDDKC
    CFIEAHGHBFEHCGCIBIAV"
 30 B$="AWWWHOWWERWWUBNJCREQYWWR"
 40 FL=2:X=4:Y=4:FOR F=1 TO 79:C$=MID$(A$,F,1)
 50 FOR N=1 TO ASC(C$)-64:M(X,Y)=FL:X=X+1:IF X=26 THEN X=4:Y=Y+1
 60 NEXT:IF FL=2 THEN FL=1 ELSE FL=2
 70 NEXT:FL=4:X=3:Y=4:FOR F=1 TO 24:C$=MID$(B$,F,1):N=ASC(C$)-64+X
 80 IF N>25 THEN N=N-22:Y=Y+1:GOTO 80
 90 X=N:M(X,Y)=FL:NEXT
100 RESTORE:FL=3:X=3:Y=4:FOR F=1 TO 28:READ N:N=N+X
110 IF N>25 THEN N=N-22:Y=Y+1:GOTO 110
120 X=N:M(X,Y)=FL:NEXT:M(14,14)=4.035:X=14:Y=24
130 CLS0:FOR F=1 TO 12:PRINT @(F*32+6),STRING$(12,175);:NEXT
140 L=1:W$=CHR$(128):FOR V=Y-2 TO Y+2:FOR H=X-2 TO X+2:Z=M(H,V):IF
     Z=INT(Z)THEN Z=Z+0.128
150 D=(Z-INT(Z))*1000:D=INT(D+0.1)
160 ON INT(Z+1) GOTO 170,180,190,200,210
170 L$(L)=L$(L)+W$+W$:L$(L+1)=L$(L+1)+W$+CHR$(D):GOTO 220
180 L$(L)=L$(L)+CHR$(138)+W$:L$(L+1)=L$(L+1)+CHR$(138)+CHR$(D):GOTO
     220
190 L$(L)=L$(L)+CHR$(140)+CHR$(140):L$(L+1)=L$(L+1)+W$+CHR$(D):GOTO
     220
200 L$(L)=L$(L)+CHR$(136)+W$:L$(L+1)=L$(L+1)+W$+CHR$(D):GOTO220
210 L$(L)=L$(L)+CHR$(142)+CHR$(140):L$(L+1)=L$(L+1)+CHR$(138)+CHR$(
    D):GOTO 220
220 NEXT:L=L+2:NEXT:L$(6)=LEFT$(L$(6),5)+CHR$(248)+MID$(L$(6),7)
230 FOR F=2 TO 11:PRINT @(F*32+7),L$(F-1);:L$(F-1)="":NEXT:PRINT @
    341,"-NEXT MOVE-";
240 F=INT(M(X,Y)):D$=INKEY$:ID D$=""THEN 240
250 X1=X:Y1=Y:D=ASC(D$)
260 IF D=94 THEN Y1=Y-1:T=INT(M(X,Y1)):IF F=2 OR F=4 THEN 240
270 IF D=10 THEN Y1=Y+1:T=INT(M(X,Y1)):IF T=2 OR T=4 THEN 240
280 IF D=8 THEN X1=X-1:T=INT(M(X1,Y)):IF F=1 OR F=4 THEN 240
290 IF D=9 THEN X1=X+1:T=INT(M(X1,Y)):IF T=1 OR T=4 THEN 240
300 IF D>64 AND D<91 THEN M(X,Y)=M(X,Y)+(D+32)/1000:PRINT @ 341,"DR
    OP MARKER";:FOR K=1 TO 500:NEXT:GOTO 230
310 IF D=32 THEN M(X,Y)=INT(M(X,Y))+0.128:PRINT @ 341,"PICK MARKER"
    ;:FOR K=1 TO 500:NEXT:GOTO 230
320 PRINT @ 341,"PLEASE WAIT";:X=X1:Y=Y1:GOTO 140
330 DATA 98,23,43,23,15,2,3,5,3,4,11,5,3,39,23,23,15,8,14,9,14,9,23
    ,23,12,11,12,11
```

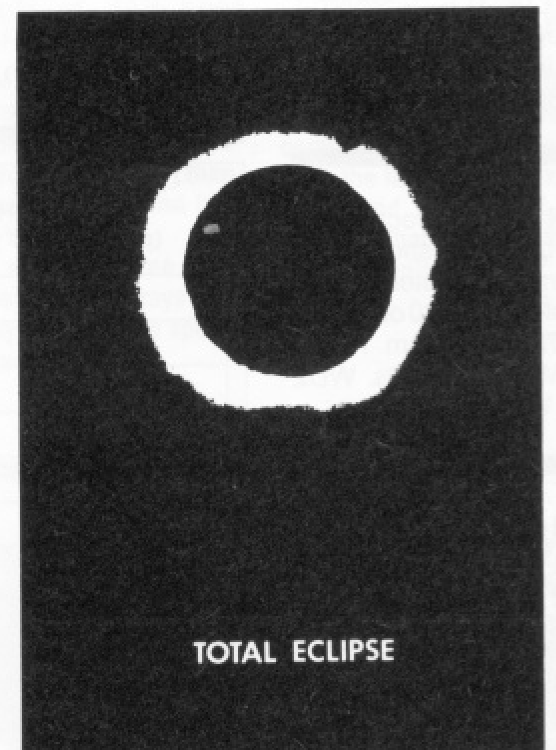
FROM time to time — from centuries in the past to centuries into the future, in fact — we get anxious sub-ether waveband calls asking where there are to be had copies of that notorious saga of the black holes, *Total Eclipse*.

Well, the easy answer to that sank into a black hole long ago, but just for the meanwhile, John Penn Discount Software have come up with a cache, a batch, a stash of the great hole itself, and ten genuine *Total Eclipses* have been set aside for the winners of this month's maze comp. The ten runners up will get John Penn discount vouchers.

Rules

When you have found your way back to where you started, analyse your conclusions, print them out onto whatever you normally print onto, write us any notes you think we should have, and send your solution off to the usual address in an envelope marked DECEMBER COMPETITION. Don't forget to include your name and address.

This month's tiebreaker is an easy one. Take the sentence 'I fell into a black hole, and when I came out ...' and just think hard about the last time you had a hangover or missed a deadline. Complete the sentence. Geronimo!



September winners

Prime stuff, this. Because of the great September holdup, we're a bit short of winners for September, which we suppose is appropriate for *Miser's Dream*. But the winning efforts were honourable as usual. The spares will go into the Editor's Magic Bottomless Box for the needy and deserving and people who do the crosswords properly. The winners:

S A Siddiqui of Chiswick, Phil Sapiro of Liverpoool, J. Smith of Twyford, Graham Barber of Sutton Coldfield, S. Frazer of Edinburgh, John Smallwood of Preston, Michael White of Salford, Paul Weedon of Wotton-under-edge, Pete Faraday of Warrington, P. Morgan of Bristol, F J Taylor of Acklam, D J Gray of Middlesbrough, T. Fawcett of Hendon, Fred Williers of Yarnfield, and Austan Henderson of Bromsgrove.

My favourite tiebreaker came from John Smallwood: 'As soon as I've made my first million, I'll stop doing my paper round.' Don't stop writing the software, John!

Solution

This month's solution is opposite.

Using this method, you will be able to find the centre of any maze. Your route will not necessarily be the shortest possible, but it will work.

To give you practice you may like to try the method out using the listing given here which generates a maze layout around which you can travel by using the four arrow keys. You are given a birds-eye view of the portion of the maze around your present position which enables you to see just the neighbouring passages. Your position is denoted by the @, and the centre of the maze by the #. To assist you in your task you can also drop markers. By pressing any letter key (A to Z) an appropriately labelled marker will be left behind when you move on. To pick up any marker use the space bar.

Take care when typing in the program — especially lines 20 and 30, and the DATA line 330, as these determine the layout of the maze. The actual method that the program uses to create the maze from this information is deliberately devious!

Now for the competition. I have a small cuboid of wood which measures 6 by 7 by 8 centimetres in size. The cuboid has been painted on each of its six faces and I have now sawn tit into 336 centimetre cubes. Of these smaller cubes, 216 of them will have at least one face painted, while the remaining 120 cubes (those from the inside of the original cuboid) will be completely unpainted. If I were to collect all of the painted cubes I could build them into an exact 6 by 6 by 6 cube. This is the smallest cuboid (having its principal dimensions differing by 1 centimetre) that is possible.

The next largest in the series would be one measuring 48 by 49 by 50 centimetres, whose 13,824 painted cubes would form an exact larger cube 24 centimetres along each edge.

Can you determine the next largest cuboid that is possible under the given conditions?

The Answer

This is Gordon Lee's own solution to the November competition see page 26 for results

ANSWER: The missing digits are: 7762531080

SOLUTION: The problem can be more easily handled by 'inverting' the calculation to be made. We are interested in the value of V in the following expression, with the product being equal of Ry. (y = 34542.)

$$34543 * v = R_{34542}$$

Ry represents the repunit number which consists of 34542 ones, consequently the value of v can be determined by dividing 11111111..... by 34543. The process of long division as done using pencil and paper, when taken step by step, involves determining how many times 34543 will go into a 5 or 6 digit number and the remainder so produced. This is a function easily handled by the computer, whereas the original sum is not — at least, not directly.

The program is quite simple. Starting with six 1s (as computed at line 20), this string variable is converted to its numeric equivalent (line 30). This line also defines variable A as zero. This variable will eventually represent the following digit of the dividend in the calculation. To compute this digit and also determine the remainder at each stage, the value of N (34543) is repeatedly subtracted from R at line 60. This is done until the value of R falls below that of N. Each time that a subtraction takes place the variable A is incremented by 1. Once R is less than N the program jumps to line 70. At this point R will represent the remainder to be carried forward to the next step in the calculation, and A the following digit of the dividend. R is then converted to a string variable and '1' is tagged on the end. This is equivalent to 'bringing down' a 1 if we were performing the calculation on paper. The digit in variable A is printed out on screen so that we can keep an eye on the progress of the computation. The reason for converting it to a string first is so that it can be printed without spaces appearing between the digits. Note also that when converting to a string from a numeric variable, the leading 'ghost' space is removed by using the MID$ function.

As each successive digit is computed variable D is incremented to keep a tally of the number of digits in the dividend. When this reaches 20010 the computation stops. The last ten digits on the screen are the required numbers.

Listing

```
10 R$="1":T=1:N=34543:D=0
20 IF VAL(R$)<N THEN R$=R$+"1":T=T+1:GOTO 20
30 R=VAL(R$):A=0
40 IF D=20010 THEN PRINT:PRINT"Computation complete at 20010th digit":END
50 IF R<N THEN GOTO 70
60 R=R-N:A=A+1:GOTO 40
70 R$=STR$(R):A$=STR$(A):R$=MID$(R$,2)+"1":T=T+1:PRINT MID$(A$,2);:D=D+1:
   GOTO 30
```

Communication

Problem: I have had trouble trying to obtain Chess for my Dragon 32. If you know of a supplier I would be very grateful for your help.
Name: Andrew Dennison
Address: 15, Molescroft Avenue, Beverley, E. Yorkshire, HU17 7HH

Problem: Does anyone know where I can obtain a good Dragon 32 Speech Synthesiser as most companies have stopped selling them. Also, how much would it cost?
Name: M. McCullough
Address: 129 Cregagh Road, Belfast, N. Ireland BT6 0LA

Problem: Does anyone know where I can obtain the MXT Controller for the Dragon 32 as Compusense seem to no longer stock it. How much would it cost?
Name: M. McCullough
Address: 129 Creogh Road, Belfast, N. Ireland BT6 0LA

Problem: Has anyone got a Tandy Color Computer 32K version of Windows (DU July 1985), Writer (May 1985) and Analyser (November 1986), or can put me in touch with anyone who has?
Name: E. Neave
Address: 31 Ableton Lane, Severn Beach, Bristol

Problem: Anyone have an MST-CALC Spreadsheet Cassette in good nick to sell or know of something similar or better— must be cassette.
Name: Les Simpson
Address: 11 Hoof Close, Littleport, Cambs. CB6 1HU.

Write down your problem on the coupon below (make it as brief as and legible as possible) together with you name and address and send it to Communication, Dragon User, 12/13 Little Newport Street, London WC2H 7PP.

Problem ....

....

Name ....

Address ....

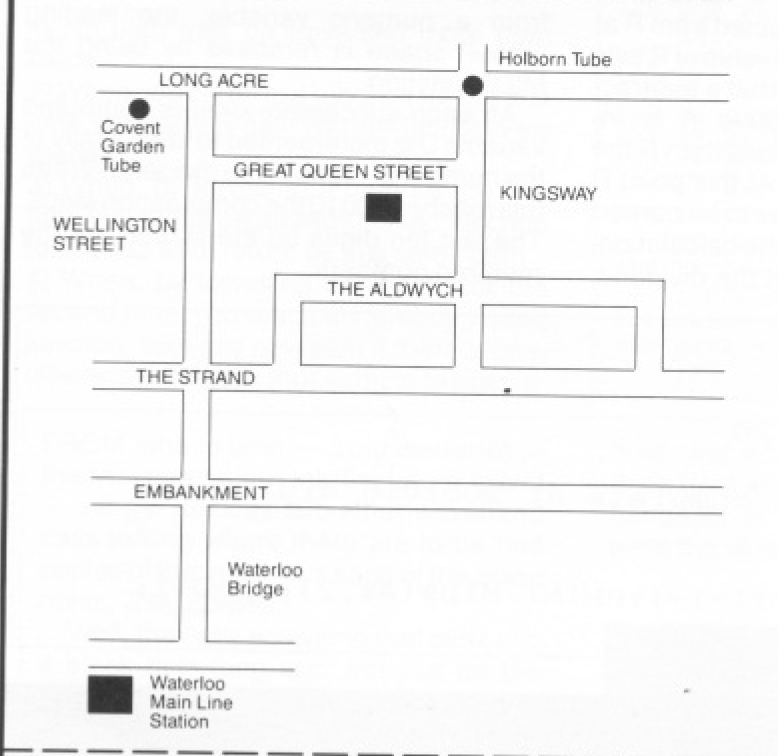
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